

# PWRAMID PRAMID

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Get ready to find out what it was like to see the pyramid in all its glory or to witness the burial of a king.

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Come on a journey across the desert sands of North Africa, toward a wonderful and mysterious place called Giza. Throughout history, people have gone to Giza hoping to find hidden treasures. It is still a place of many unsolved mysteries.

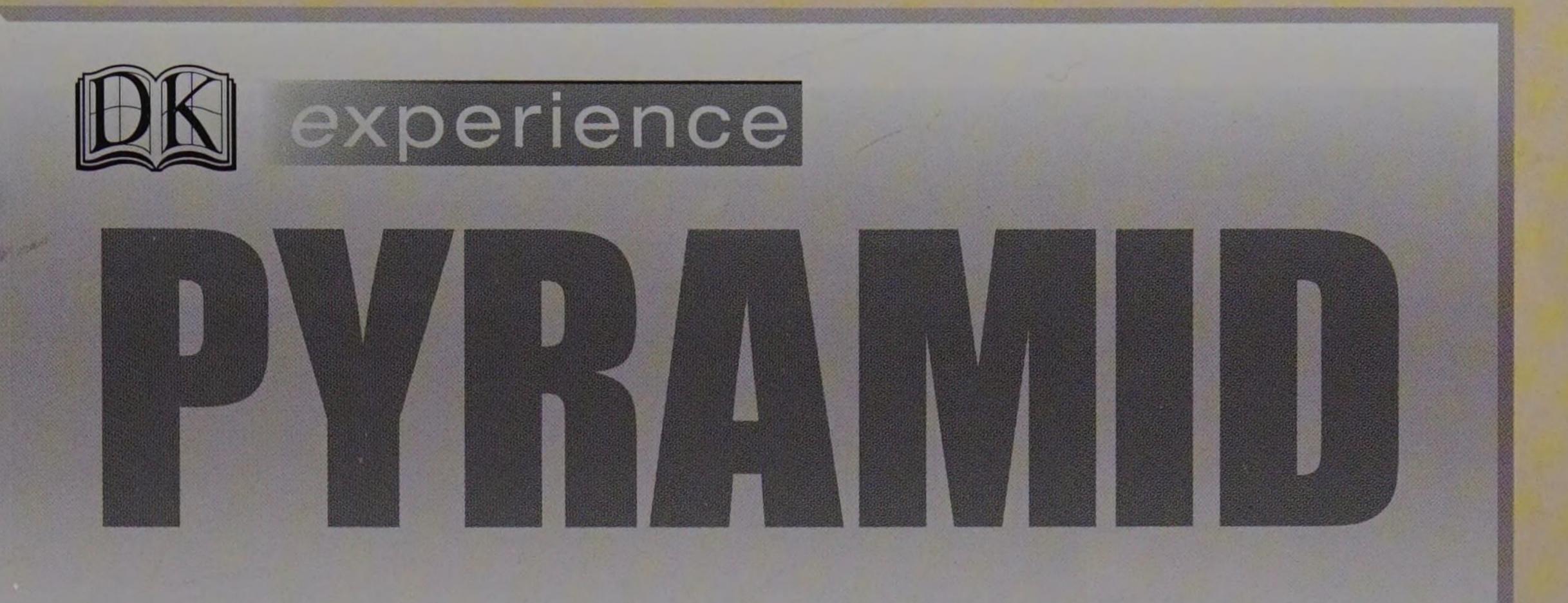
This is a journey through time as well as space. We are traveling back 4,500 years to one of the earliest civilizations on Earth. Our destination is the land of ancient Egypt, ruled by pharaohs—kings who were thought to become gods when they died.

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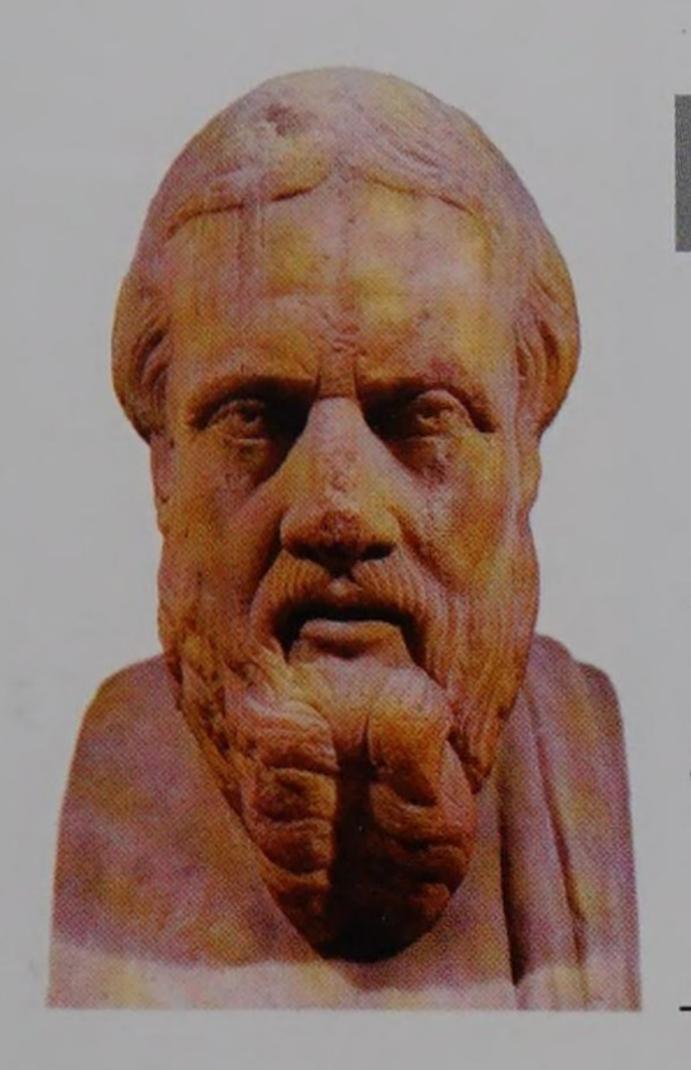
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It took more than 20 years to build the Great Pyramid of Giza. Many thousands of Egyptians worked on its construction, on behalf of their king, the great pharaoh Khufu. This is the story of how, and why, the pyramid was built.

As Giza comes into view, there is an amazing sight in front of us—a group of vast stone buildings with triangular sides and square bases. These are pyramids. The biggest and oldest at Giza is called the Great Pyramid.



written by
PETER CHRISP



## EXPLORING THE PAST

# EARLY DESCRIPTIONS

THE PYRAMIDS IN HISTORY

pyramids have stood in the desert sand at Giza in Egypt. They were built by ancient Egyptian kings called pharaohs—rulers of the first united nation-state in history.

#### Riddle in the sand

The pharaohs who erected these massive stone monuments left no writings explaining how or why they had gone about making them. Generations

of later visitors to Egypt have had to come up with their own explanations. Modern

archaeologists (people who study the past by looking at ancient buildings, burials, and artifacts) have solved some of the mysteries surrounding the pyramids, but many others remain.

#### Early accounts

The oldest description of the pyramids was written by a Greek traveler, Herodotus (his portrait is shown above). He visited Egypt in the middle of the 5th century BC, when the pyramids were already over 2,000 years old. He questioned Egyptian priests, who explained that the pyramids

were royal tombs. They
also told him pyramid
stories that had grown
up over time. For
example, the vast size of
the greatest pyramid gave people the
idea that it was built by a cruel tyrant
who enslaved his population. The
pharaoh's name was Khufu (known as

Cheops in Greek). Herodotus wrote, "Cheops plunged into all manner of wickedness."

#### Tourist attraction

By the 2nd century BC, the pyramids were famous. The Greeks believed that they were the greatest of their Seven Wonders of the World.

Many people still think that slaves built the pyramids, as shown in this painting from the 1920s. This idea has now been proved wrong.

Writing in about 200 BC, a Greek called Philo of Byzantium declared: "Everyone is mystified at the enormous strength required to put up such a weight [of stone]... the whole polished work has been joined together so seamlessly that it seems to be made out of one continuous rock."

#### Roman visitors

After the Romans conquered Egypt in 30 BC, many Roman tourists went to see the pyramids for themselves. They were amazed at the skill shown in pyramid-building, yet they could not see the purrpose of the structures. In around AD 70, the Roman historian Pliny the Elder spluttered, "The pyramids... are a pointless and absurd display of royal wealth... these men showed much arrogance in the enterprise."

"Mountains have been built on mountains. The size of the masonry is difficult for the

mind to grasp."

#### As if by magic

The Romans were followed by Arabs, who conquered Egypt in AD 642. The Arabs also found the pyramids baffling, and imagined that they must have been built using magic spells. In around AD 940, Arab writer Masoudi explained how this was done: "In carrying on the work, leaves of papyrus, or paper, inscribed with certain characters, were placed under the stones prepared in the quarries. Upon

being struck, the blocks were moved at each time the distance of an arrow shot, and so by degrees [they] arrived at the pyramids."

New theory

By the Middle Ages, many
Europeans could no
longer accept the idea
that the pyramids
were tombs. Instead,

The Jewish historian known as Flavius Josephus argued in the 1st century AD that the pyramids were built by Hebrew slaves.



they looked to the Bible for an explanation of the pyramids. They found the answer in the story of great barns or granaries, built for a pharaoh by his chief official, Joseph.

#### Guide books

From the 16th century, European travelers visited Egypt and published illustrations and descriptions of the pyramids. These publications were the first guide books to the pyramids. This was long before cameras, so the artists usually relied on their memory, or other people's, when they drew pictures. The artworks are often inaccurate and bear little resemblance to real pyramids—their sides are sometimes shown at much too steep an angle.

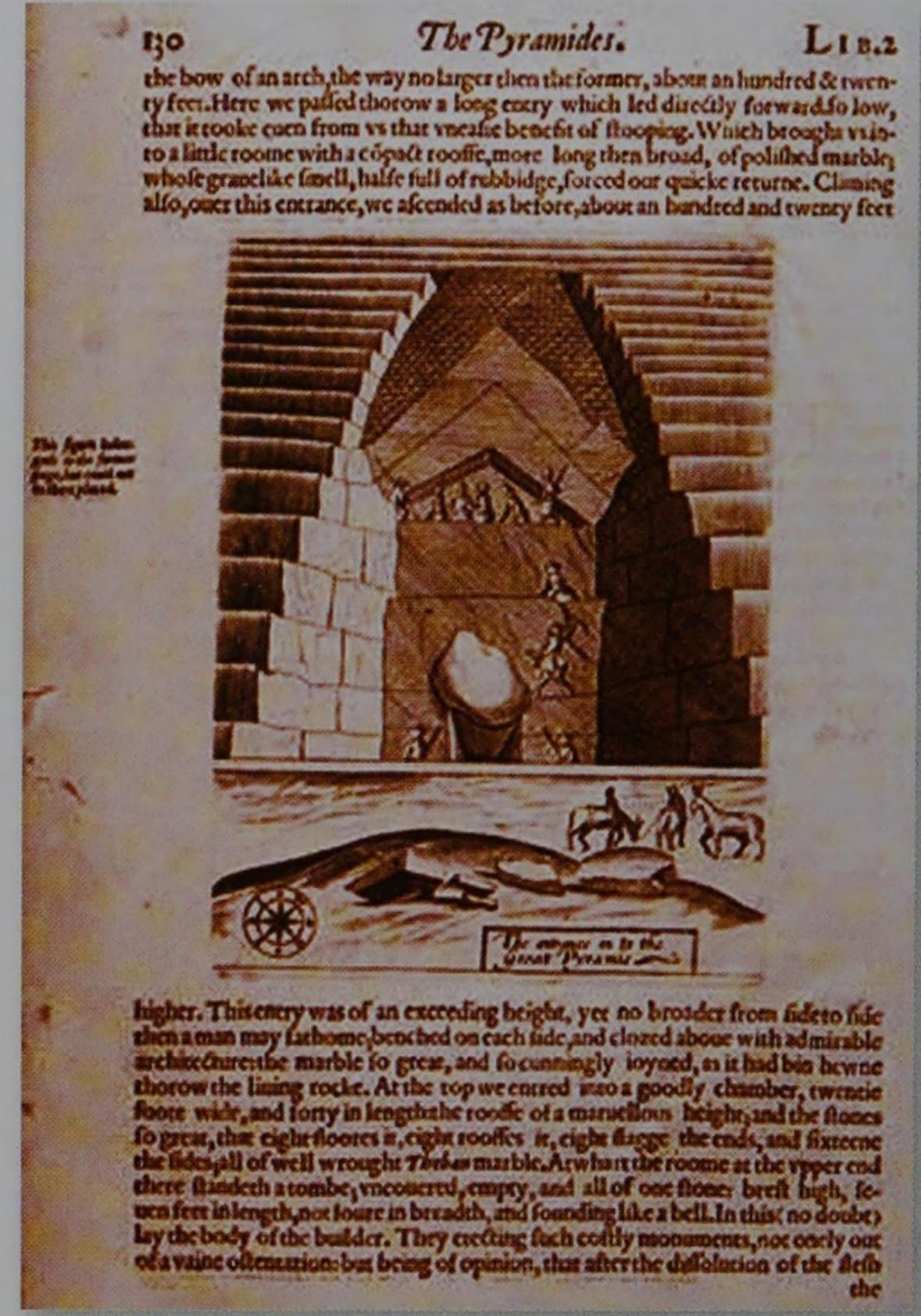
"Some men say they are the tombs of great men in ancient times... [but] they are empty inside and tombs ought not to be so high."

The Travels of Sir John Mandeville, 1356

#### Detailed research

In 1646, John Greaves, an English mathematician, published *Pyramidographia*. Greaves had traveled to Egypt to examine the pyramids. He entered the Great Pyramid, where he found himself surrounded by bats "so ugly and so large, exceeding 1 foot [30 cm] in length." Despite the bats, he was able to measure many of the internal passages, and correctly concluded that this was a royal tomb after all. Not all of his findings were as accurate. He miscalculated the measurements for the base

This beautiful mosaic in St. Mark's Cathedral in Venice, Italy, shows the pyramids as grain stores with windows and doors. Men bring wheat to fill them.

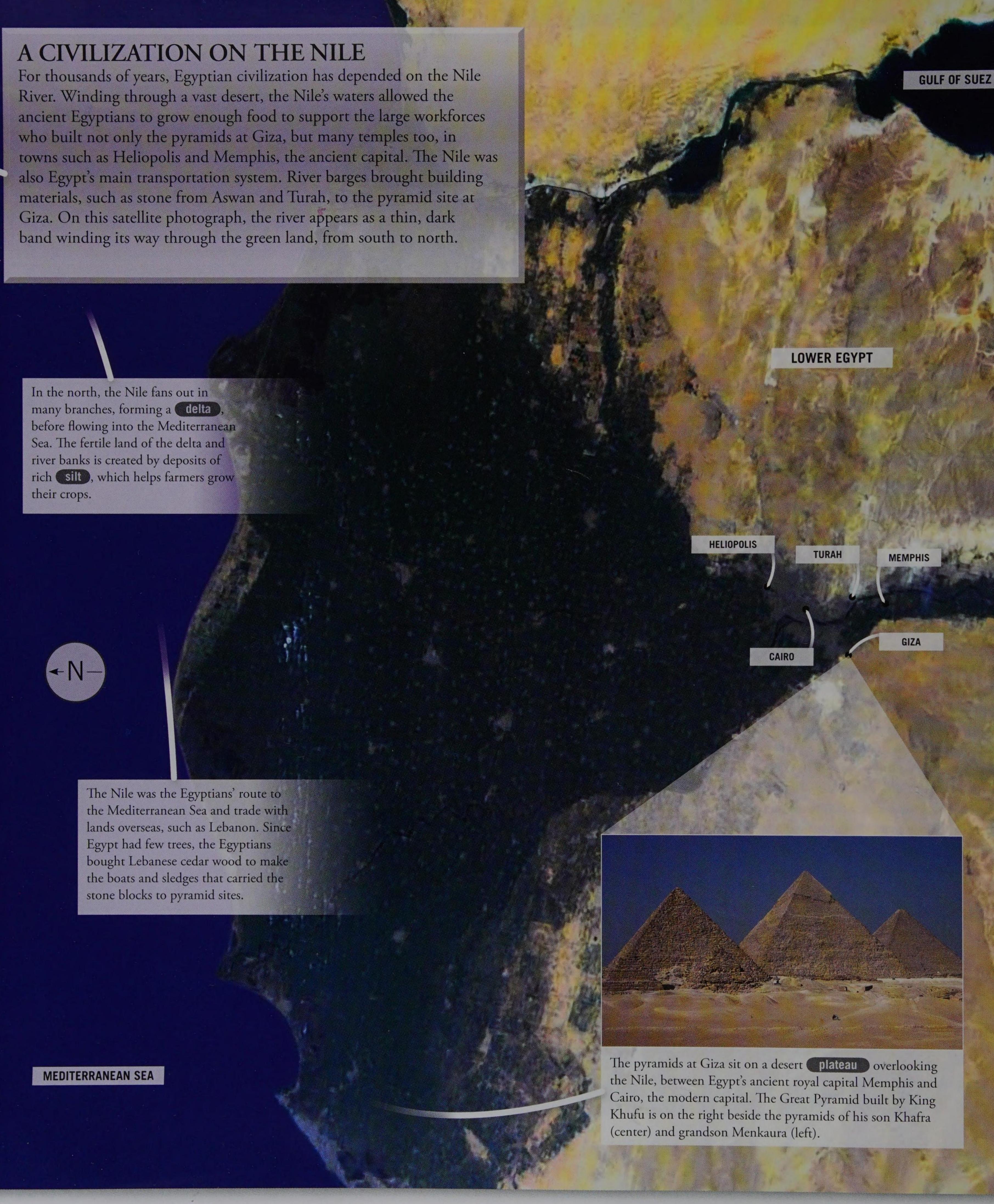


John Greaves was the first person to produce accurate pictures of the pyramids. This page from his book Pyramidographia shows the entrance to the Great Pyramid.

of the pyramid because of all the accumulated debris around it. However, his book was hugely influential and sparked a new interest in the pyramids and ancient Egypt. Scientific study of the pyramids had begun.



With the invention
of printing in the 15th
century, many books
about foreign lands
were published. The
illustrators often got
the pyramids' shape
wrong. In this
illustration from 1668,
the pyramids look
much too pointed.



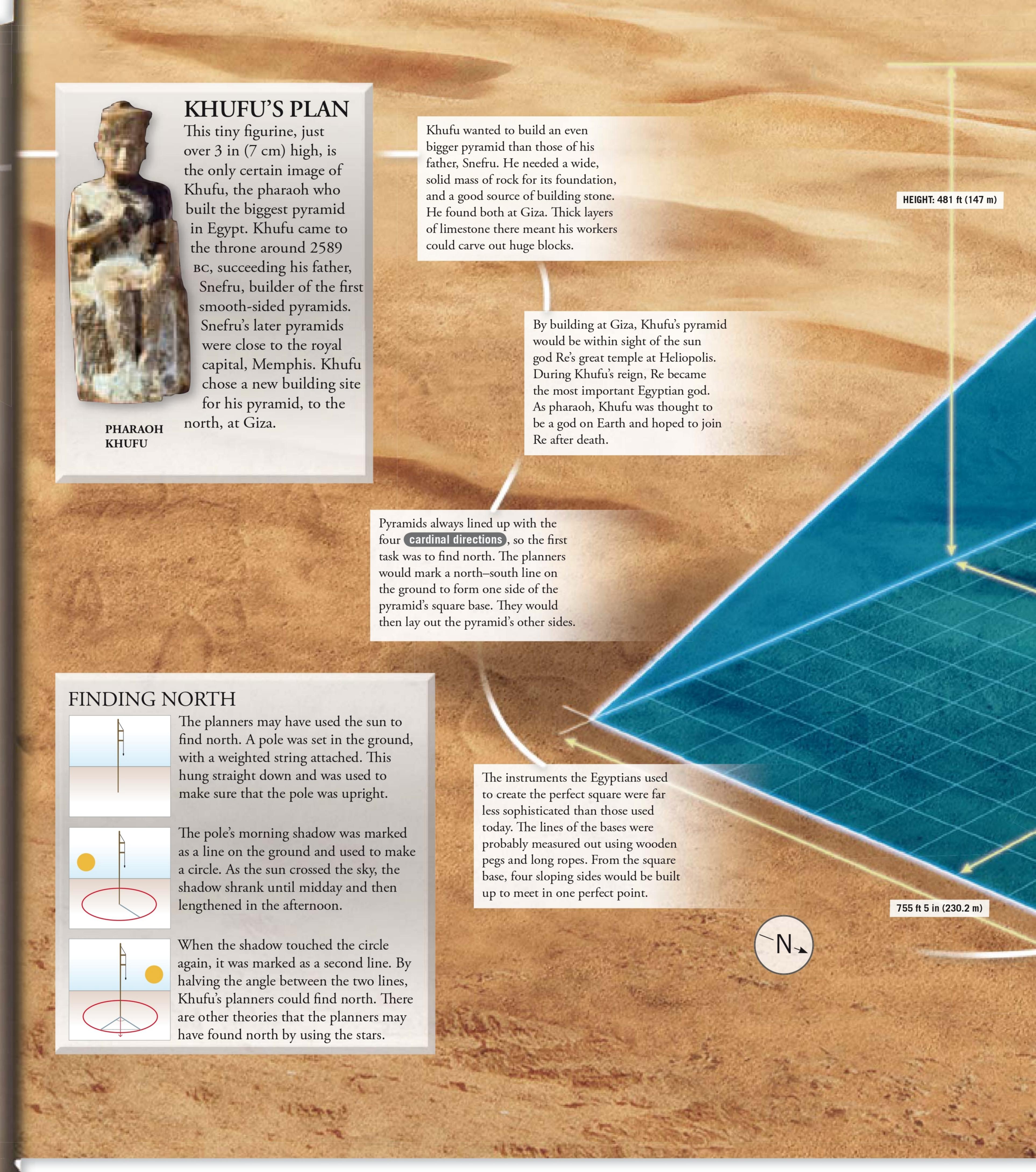


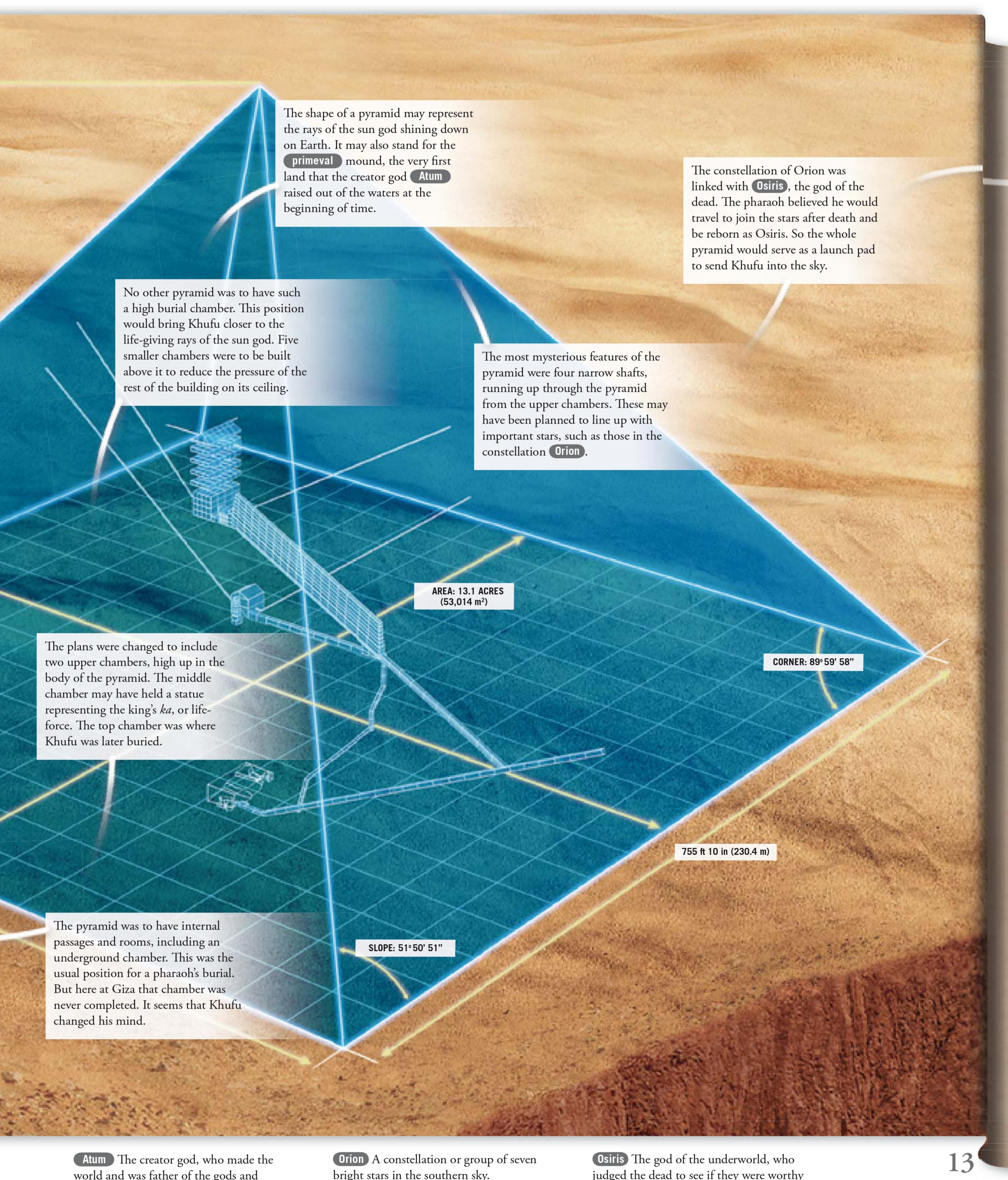
from Memphis to the Mediterranean Sea.

from Memphis to modern-day Aswan.

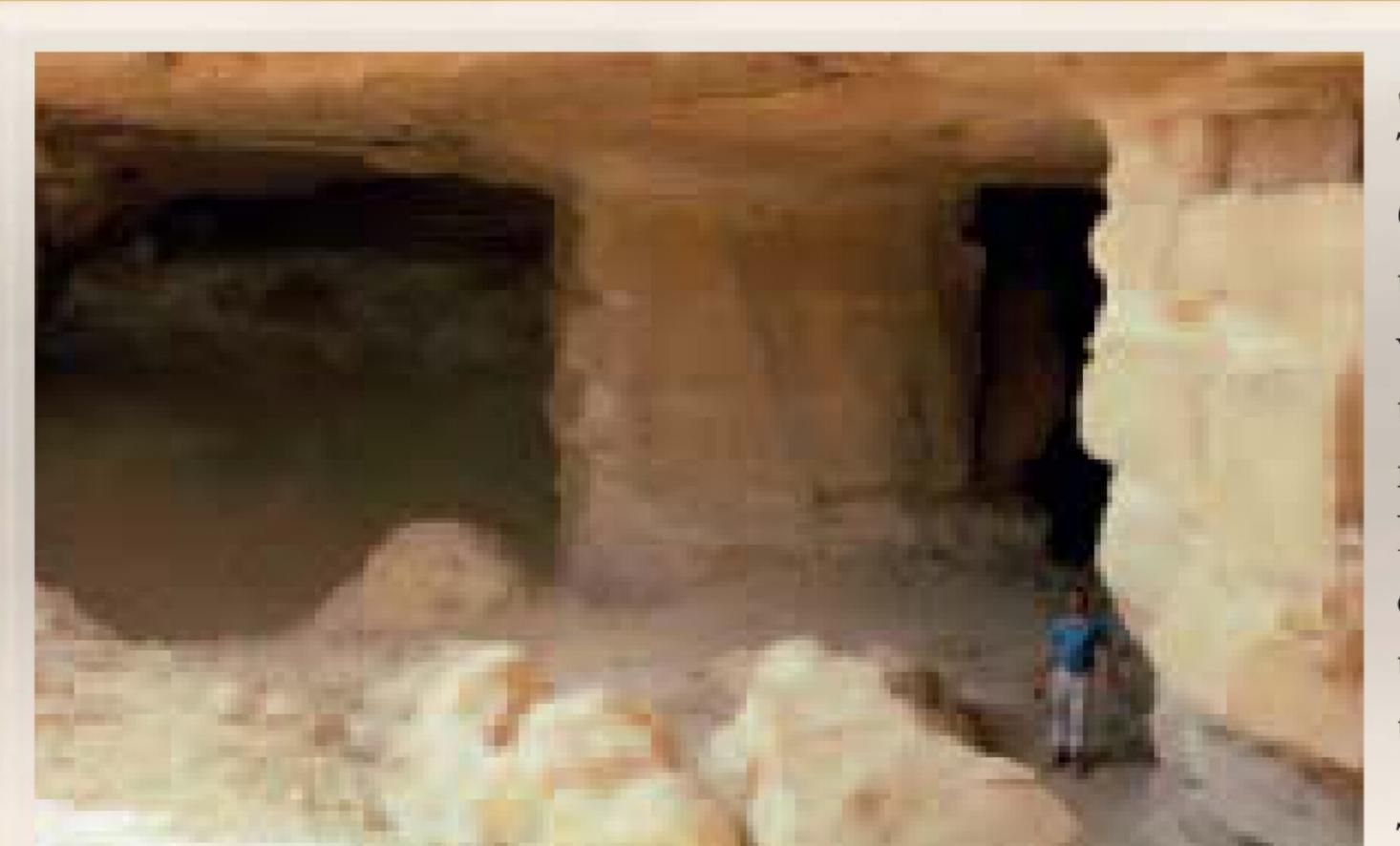










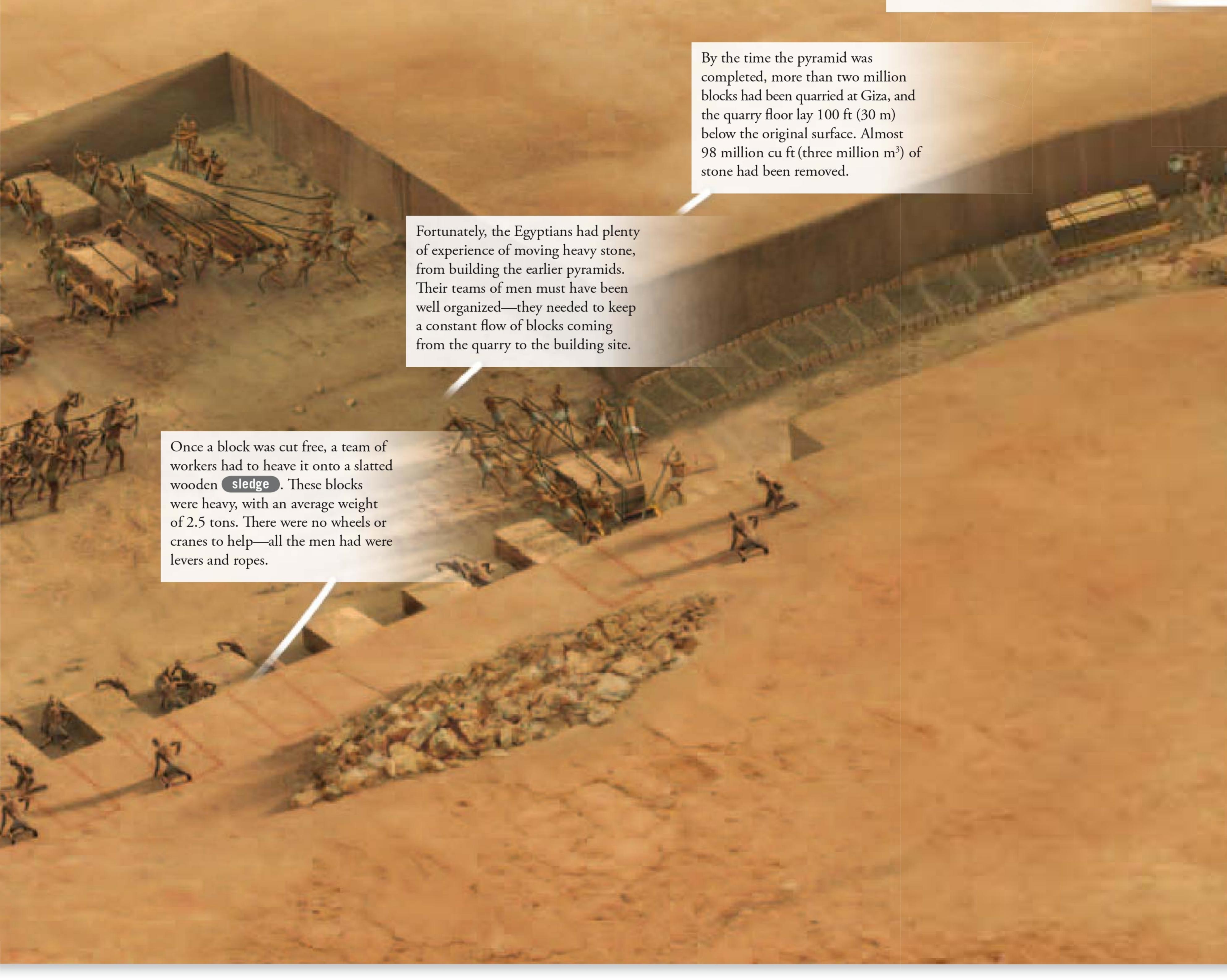


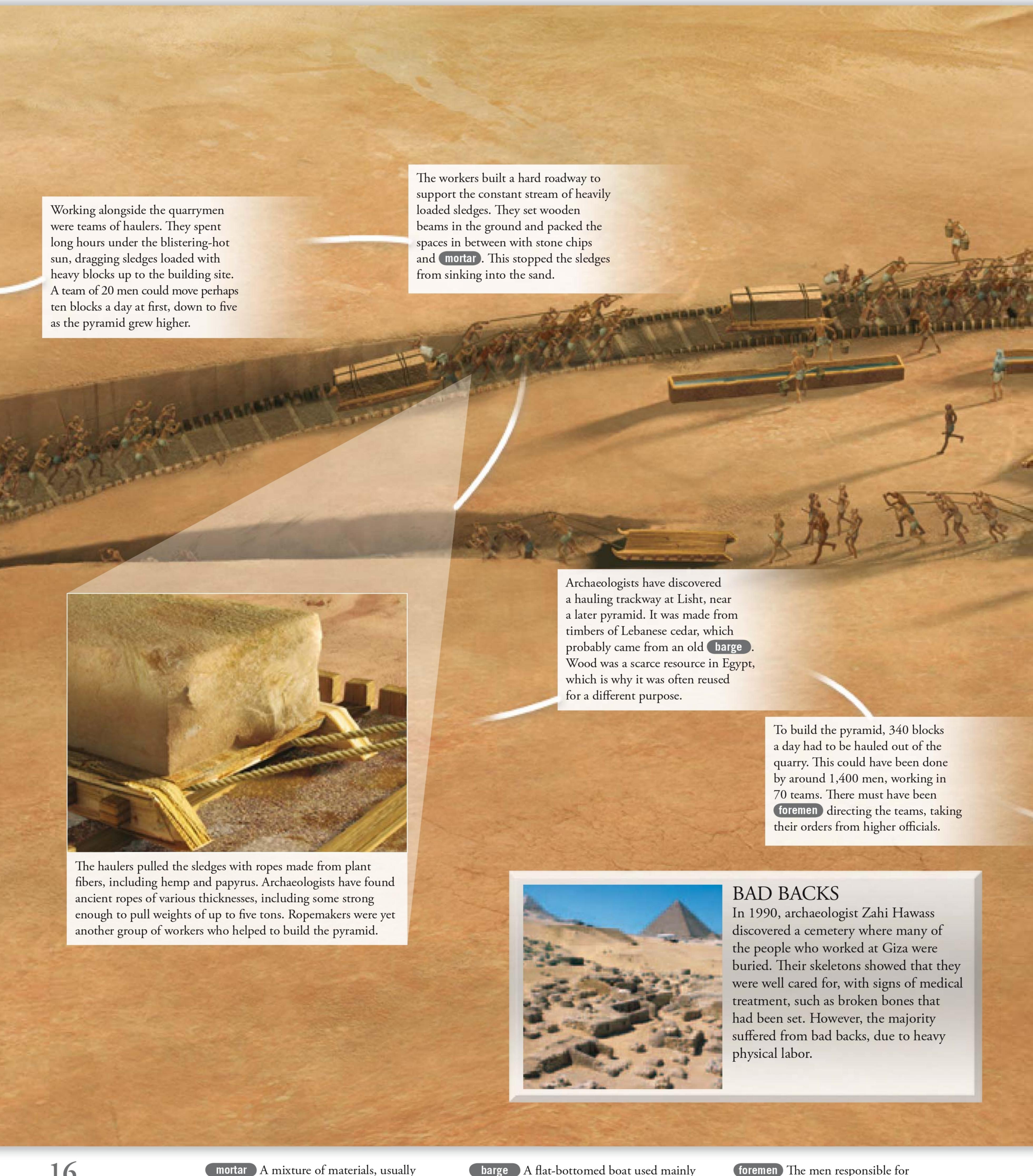
#### SHINING STONE

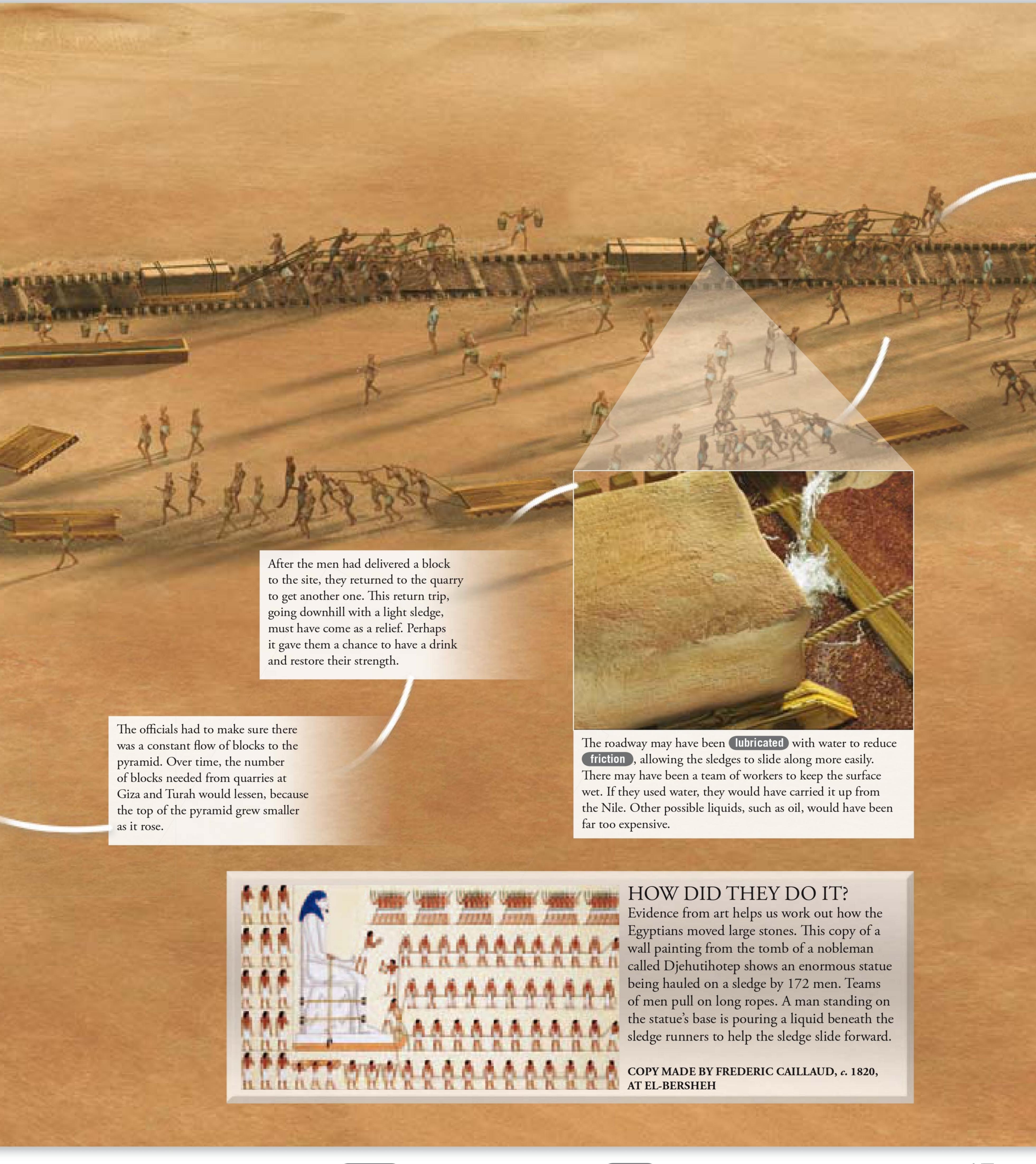
The coarse texture and dull color of Giza limestone made it unsuitable for the pyramid's casing, which Khufu wanted to shine like the sun. Instead, the builders used fine white limestone from Turah, on the east side of the Nile. This limestone lies under layers of coarser stone, so the quarrymen had to tunnel to reach it, cutting into and under the rock face.

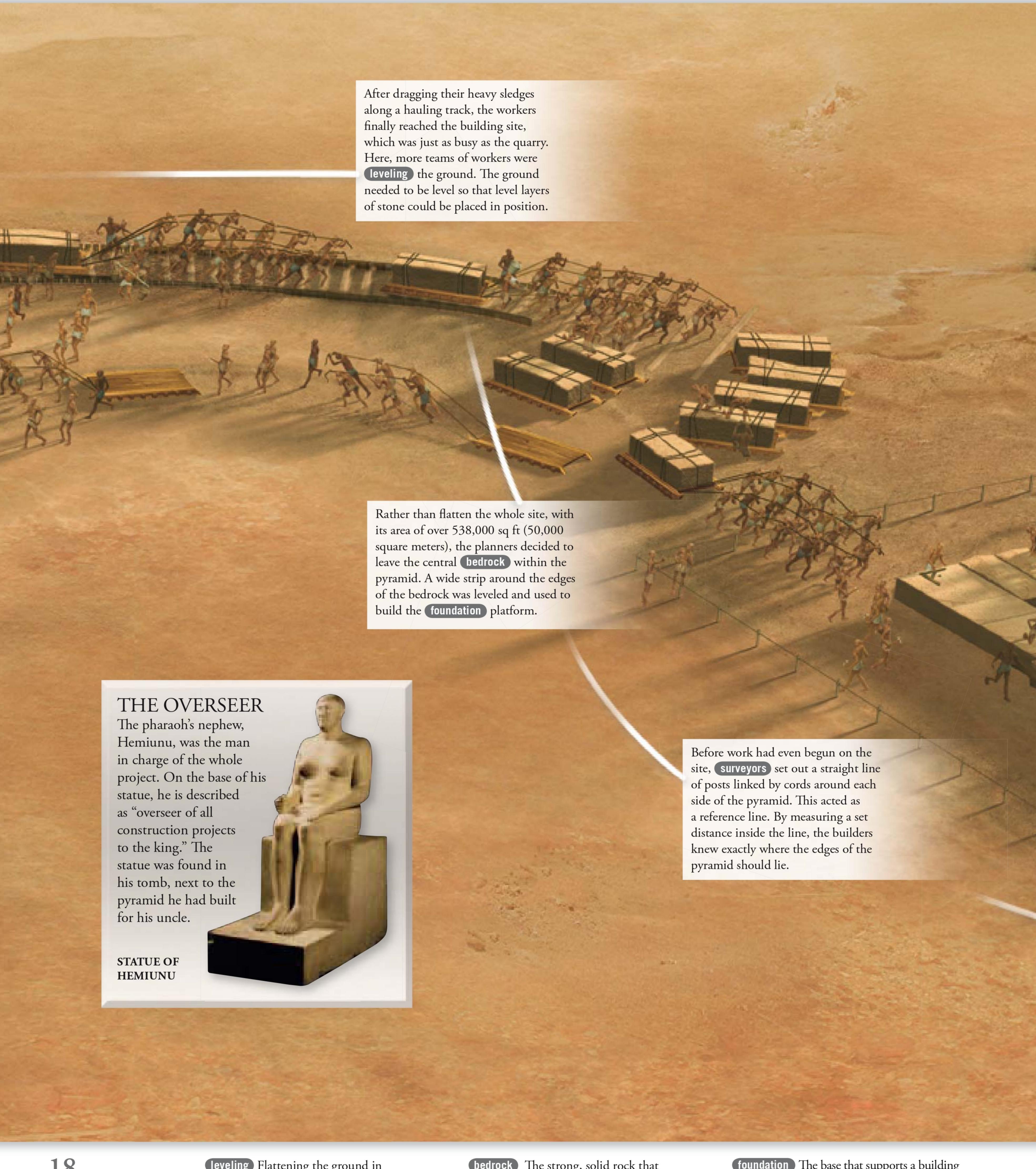
TURAH QUARRY

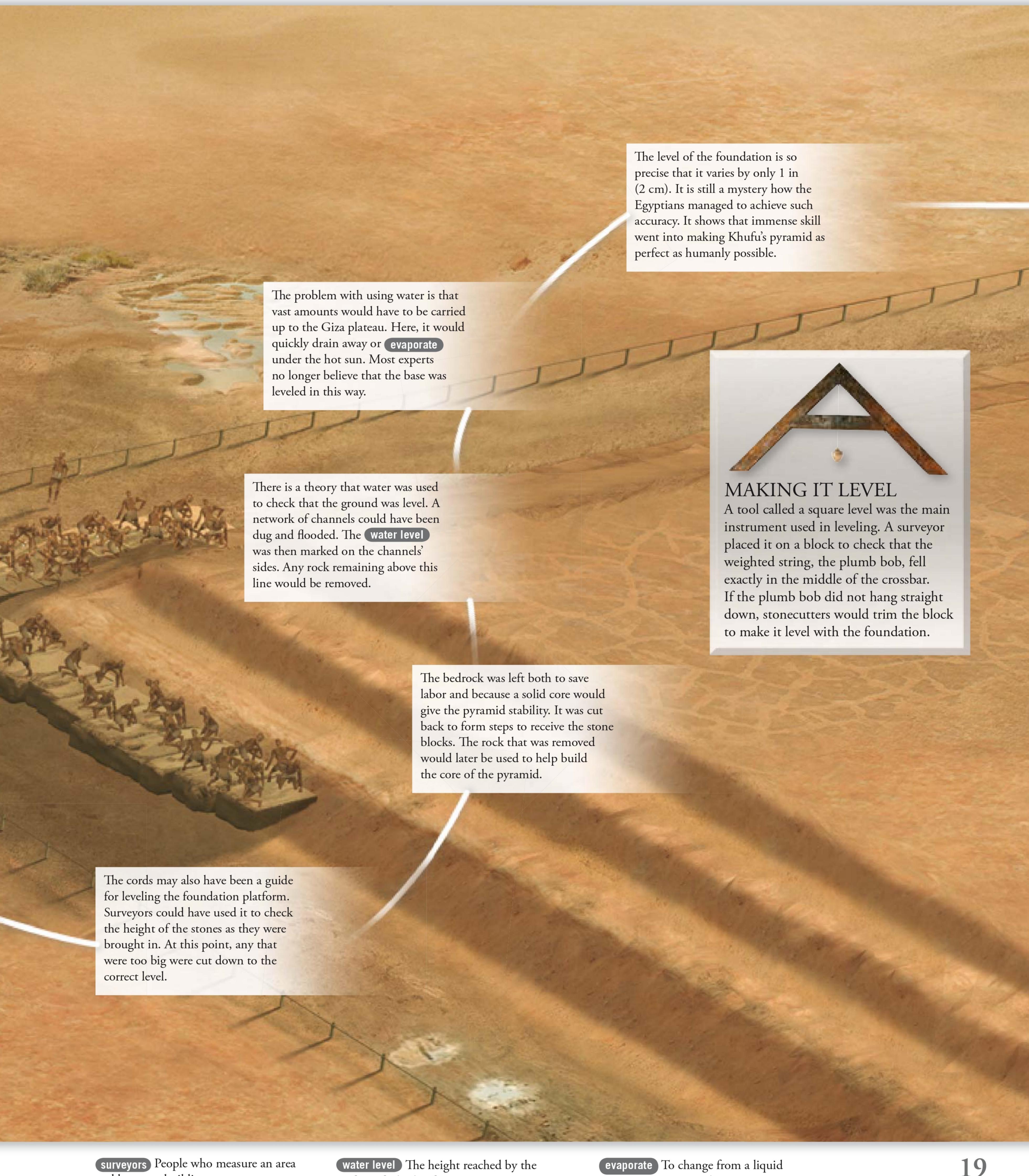
In 1992, Egyptologist Mark Lehner built a miniature pyramid as an experiment. He estimates that there must have been about 1,200 men working at Giza to quarry enough stone to build the pyramid in the pharaoh's 23-year reign.





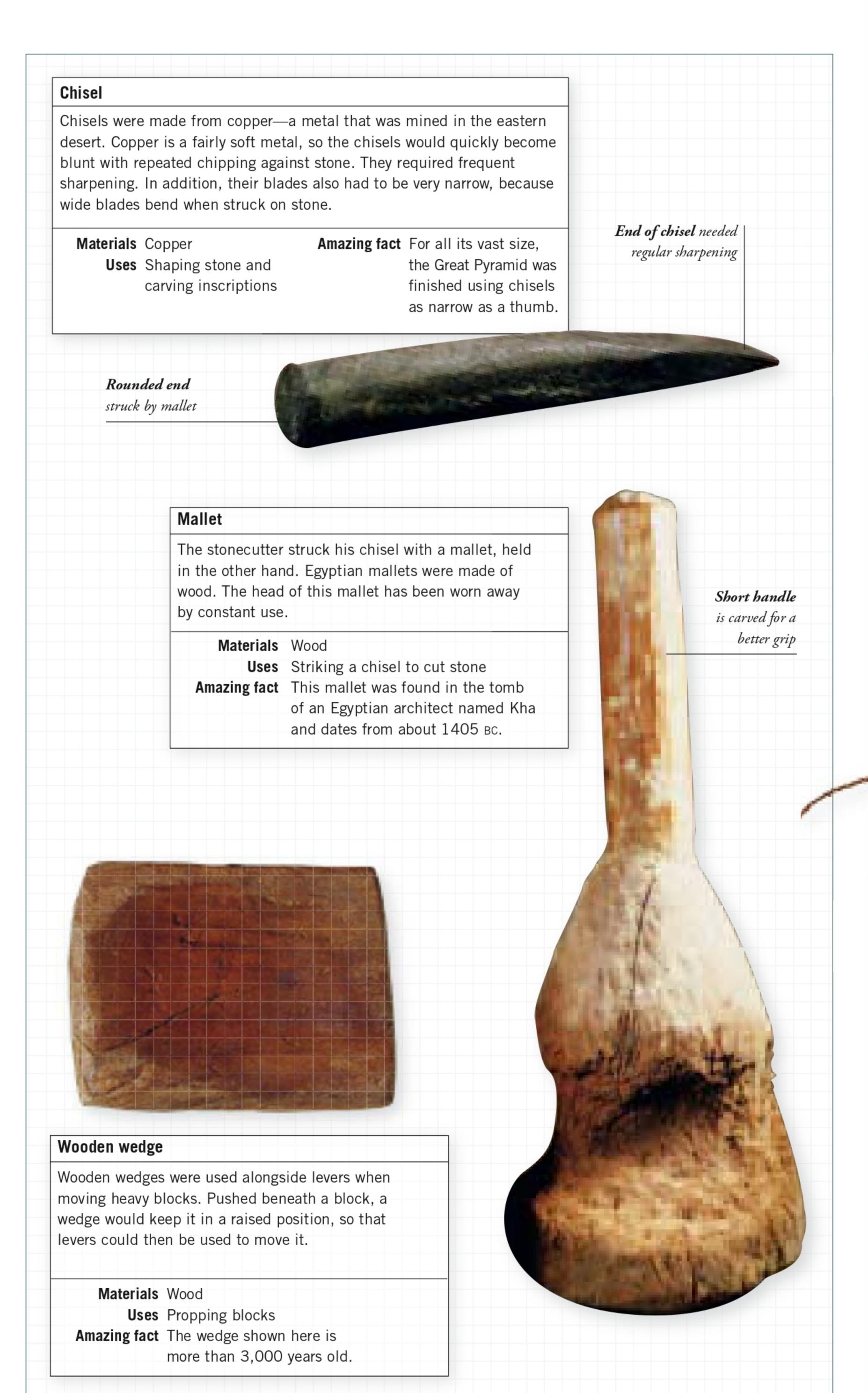


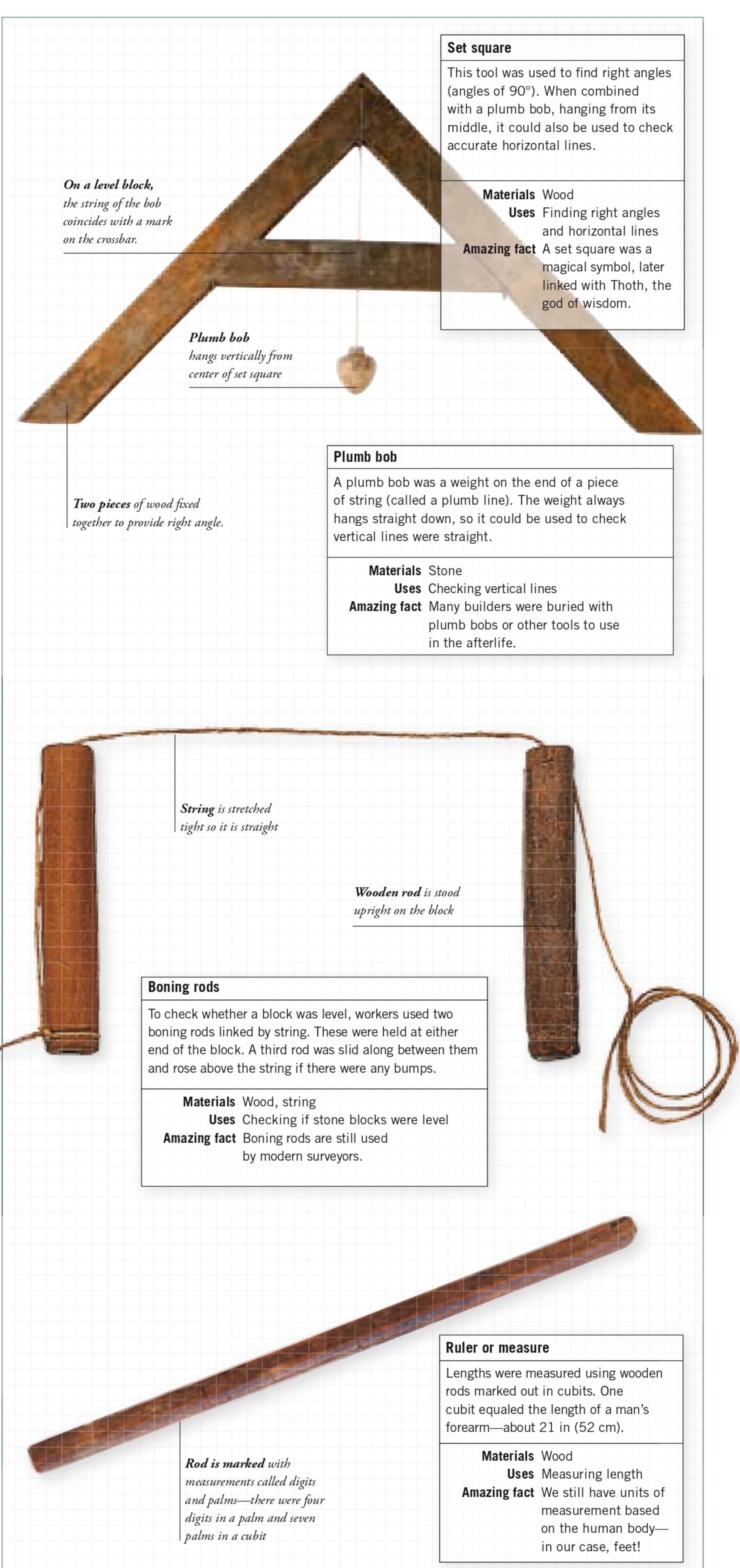


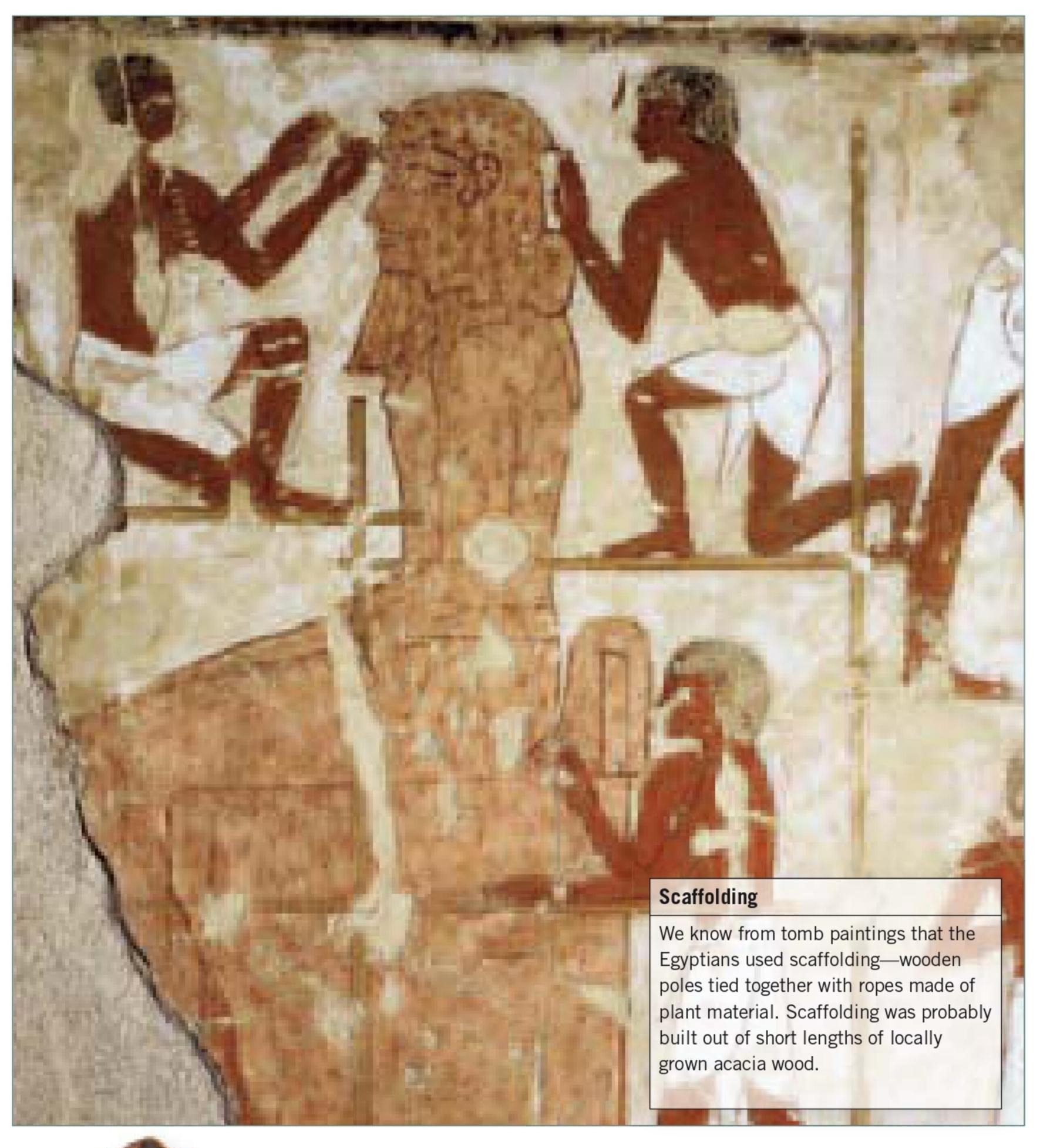


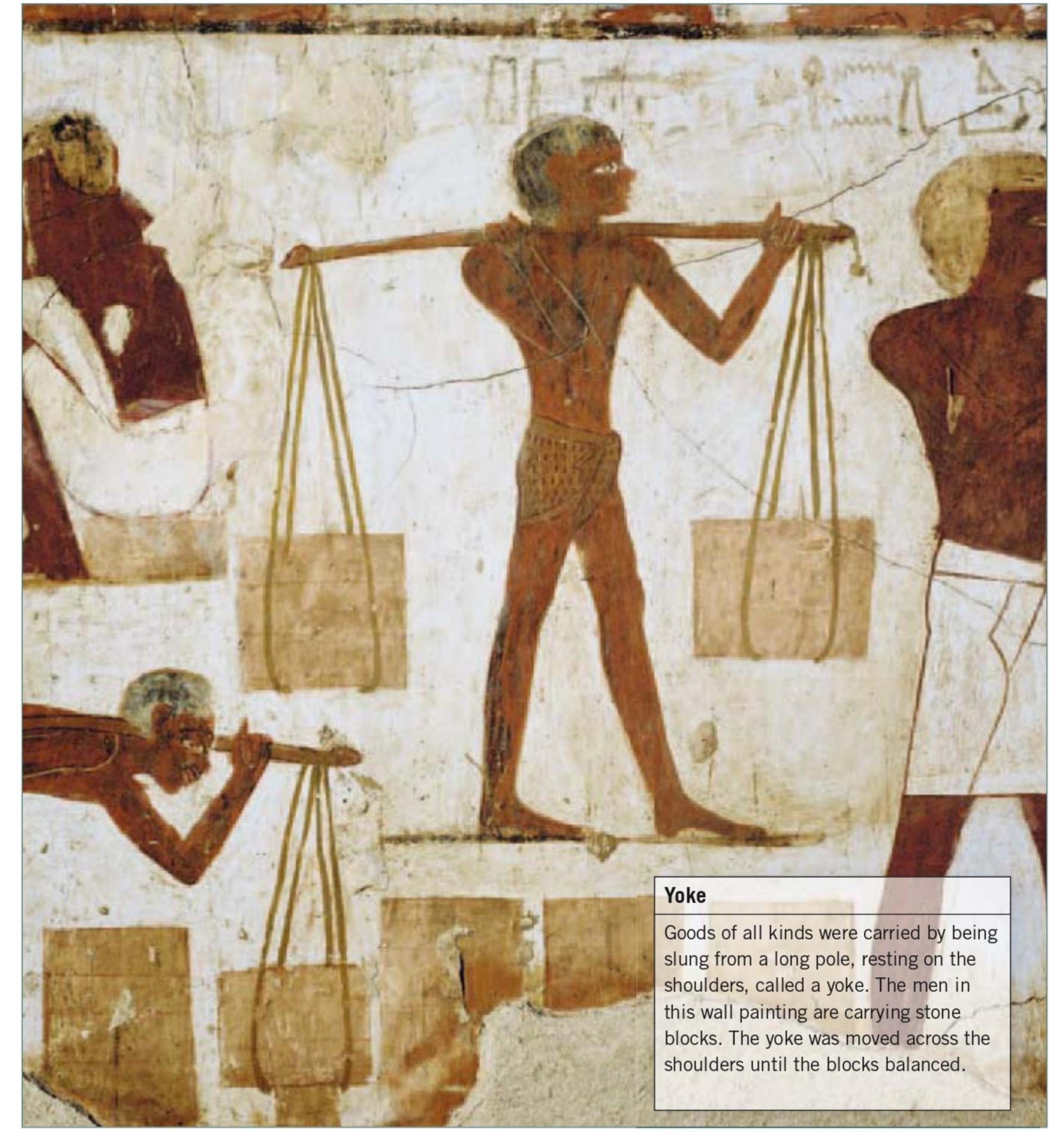
### CATALOG OF TOOLS

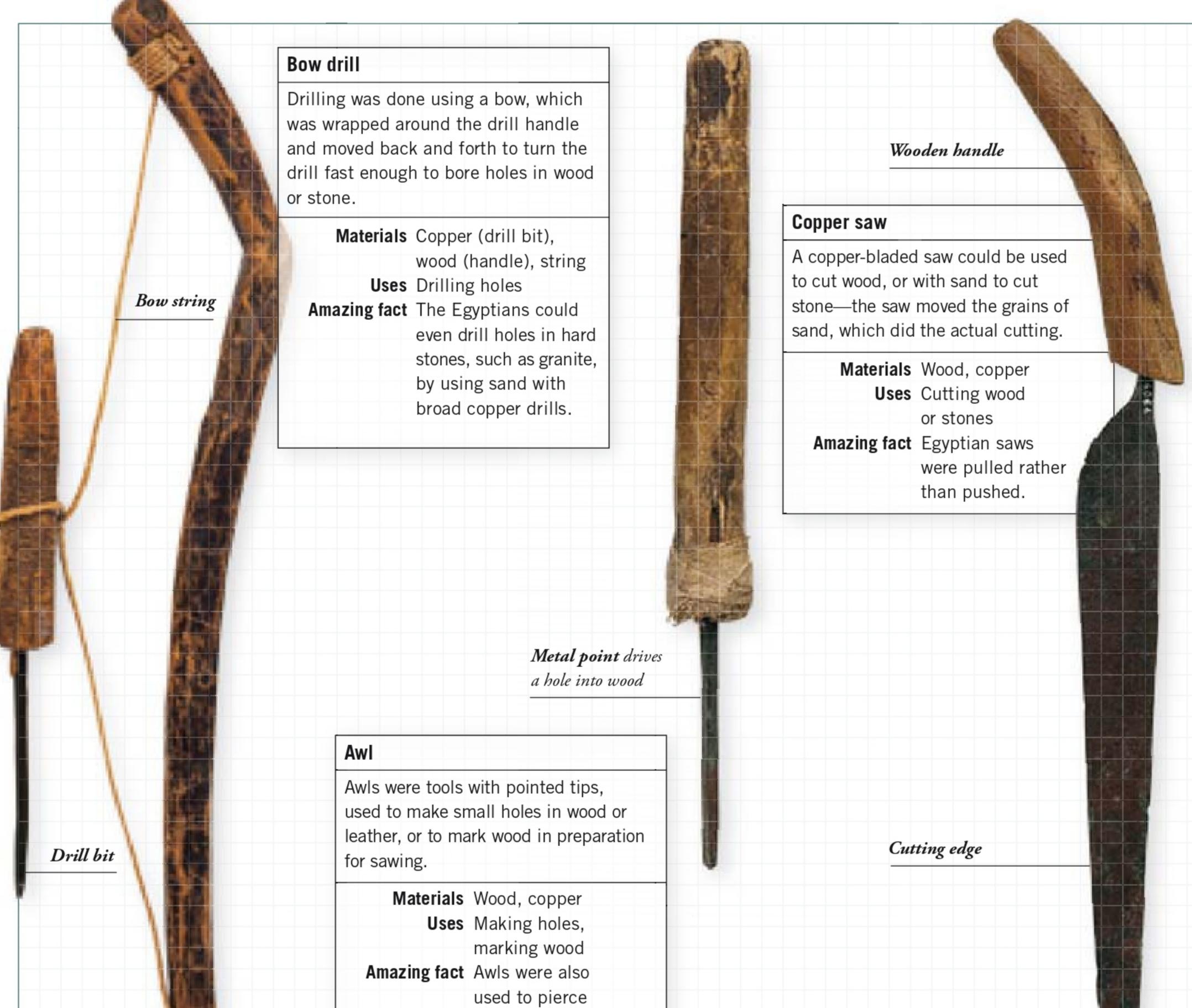
Building a pyramid was a complex task, but the tools the Egyptians used were very simple. In the time of Khufu, the Egyptians had not yet learned how to make objects from the harder metals, such as bronze or iron. Instead, they depended on stone pounders and on chisels and drills with relatively soft, copper blades. To measure angles and distances, they used plant-fiber ropes, wooden rods, and wooden set squares.



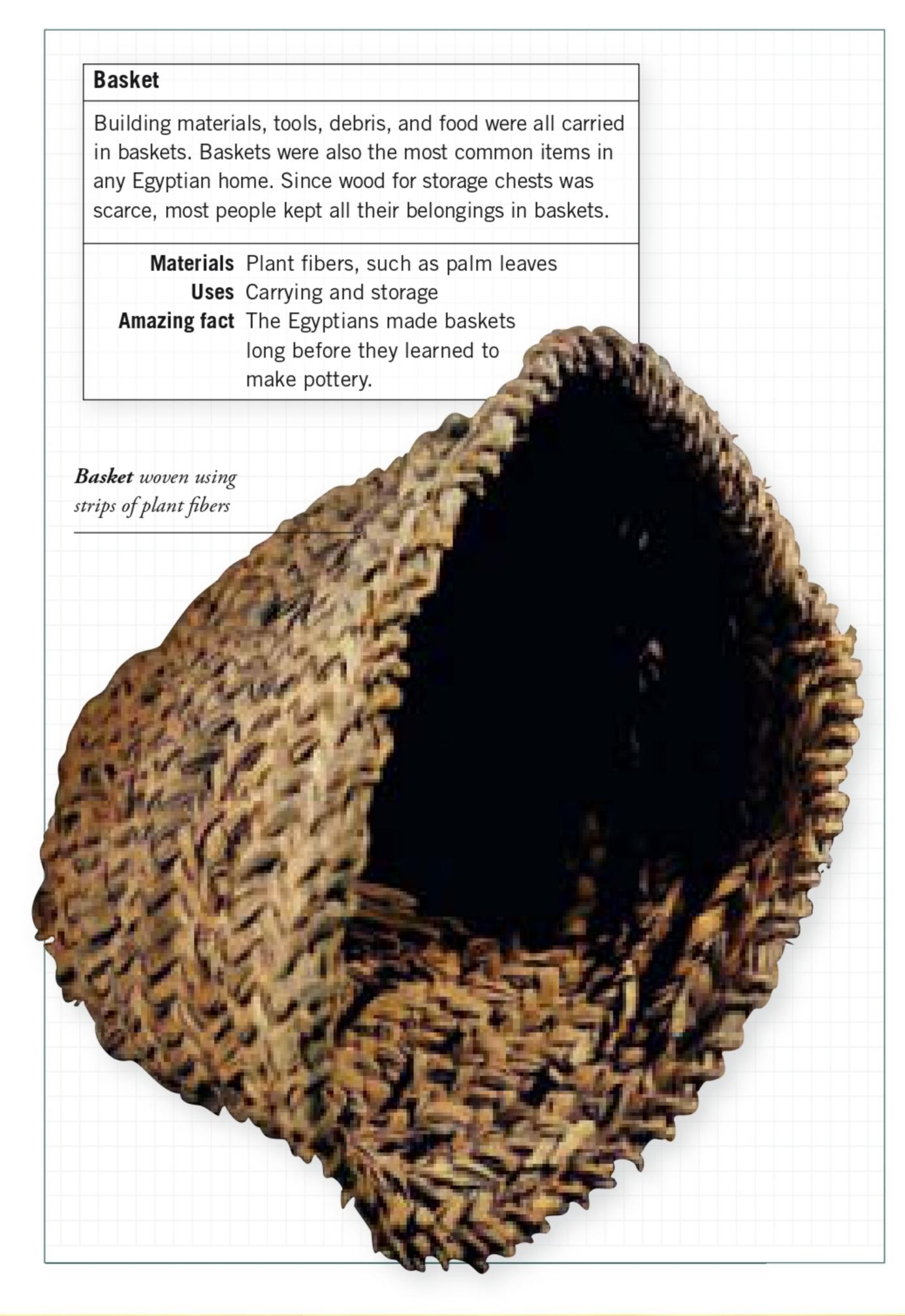


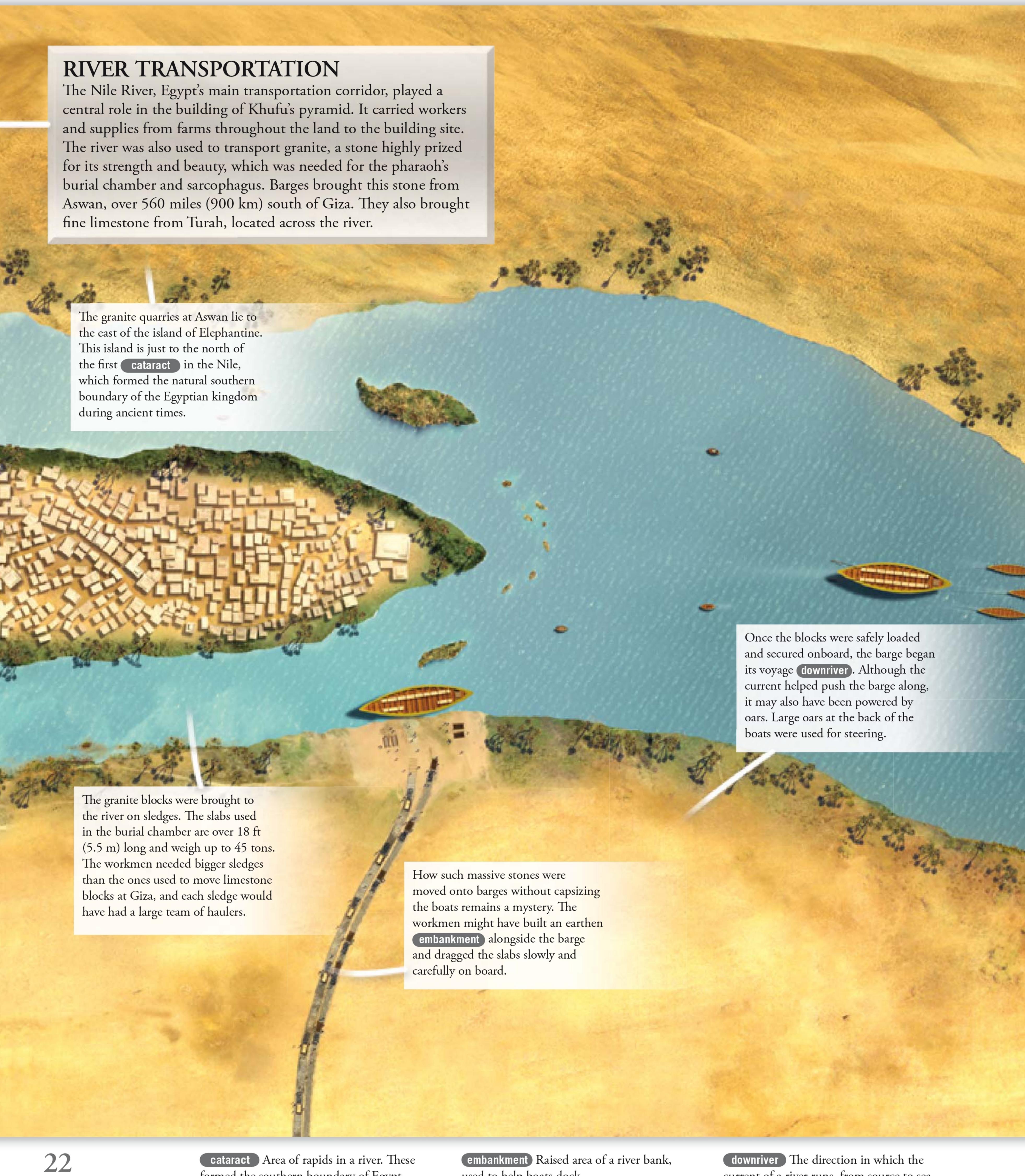


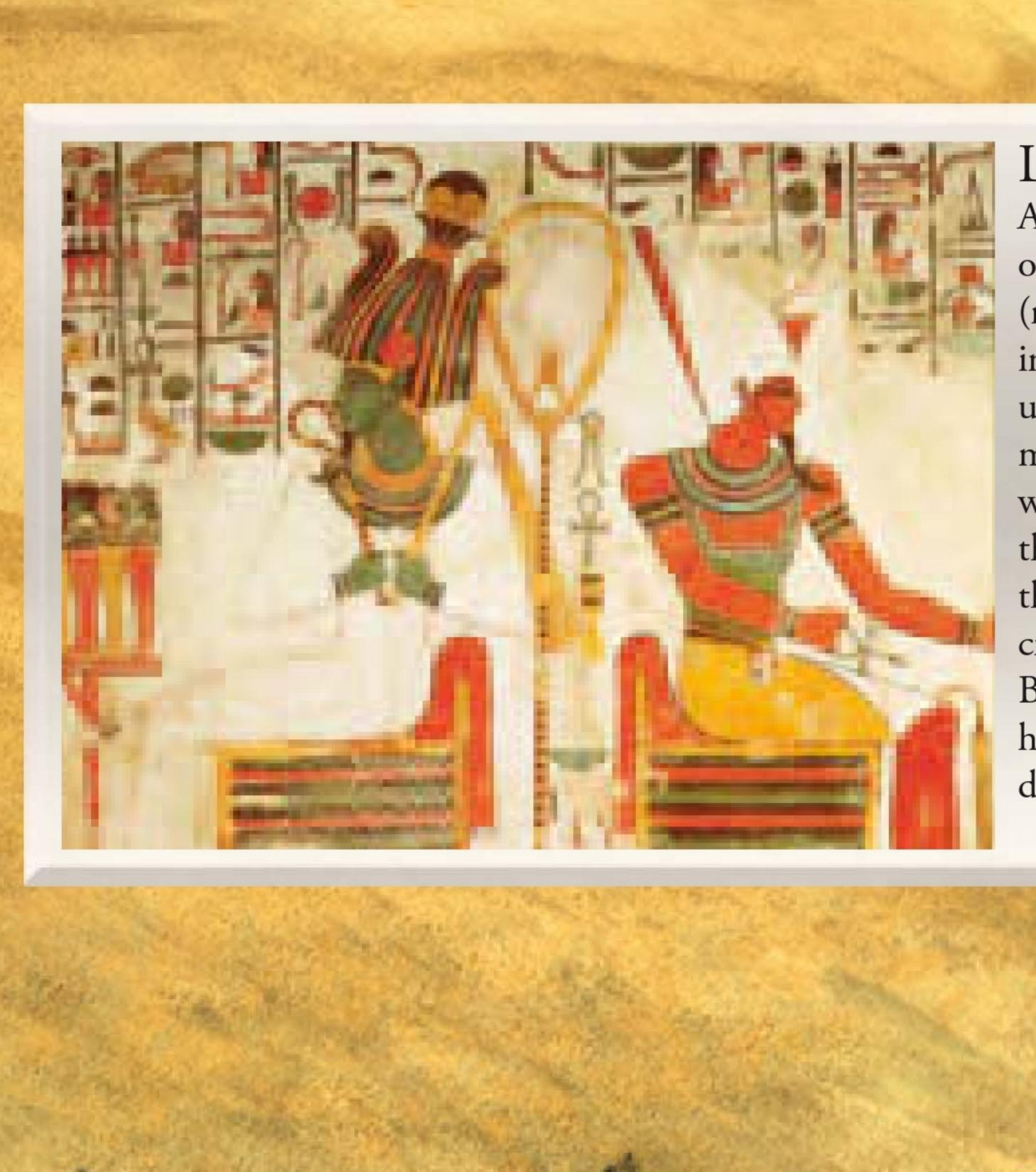




ears, for earrings.







#### LORD OF TWO LANDS

An Egyptian pharaoh was known as the "Lord of the Two Lands." Upper (southern) and Lower (northern) Egypt had been two separate kingdoms in early times. Around 3000 BC the two kingdoms united. Depending on the ceremony, a pharaoh might wear the red crown of northern Egypt, the white crown of southern Egypt, or a double crown that was a combination of the two. The figure on the right in this wall painting wears the double crown, representing the union of the two lands. Behind him sits the green-faced god Osiris, with his own special crown. Osiris was king of the dead, and the pharaoh was the king of the living.

Near Aswan, the desert comes down to the river's edge, which was dotted with acacia and palm trees. Throughout the barges' journey, the desert was never far away. Egyptians never forgot that just beyond their living green fields lay a vast, lifeless region.

Extra boats with oars may have

helped to pull along an especially

heavy barge, towing it with long

ropes. Boats going up the Nile in

the other direction could use sails

to catch the prevailing winds,

which blew from the north.

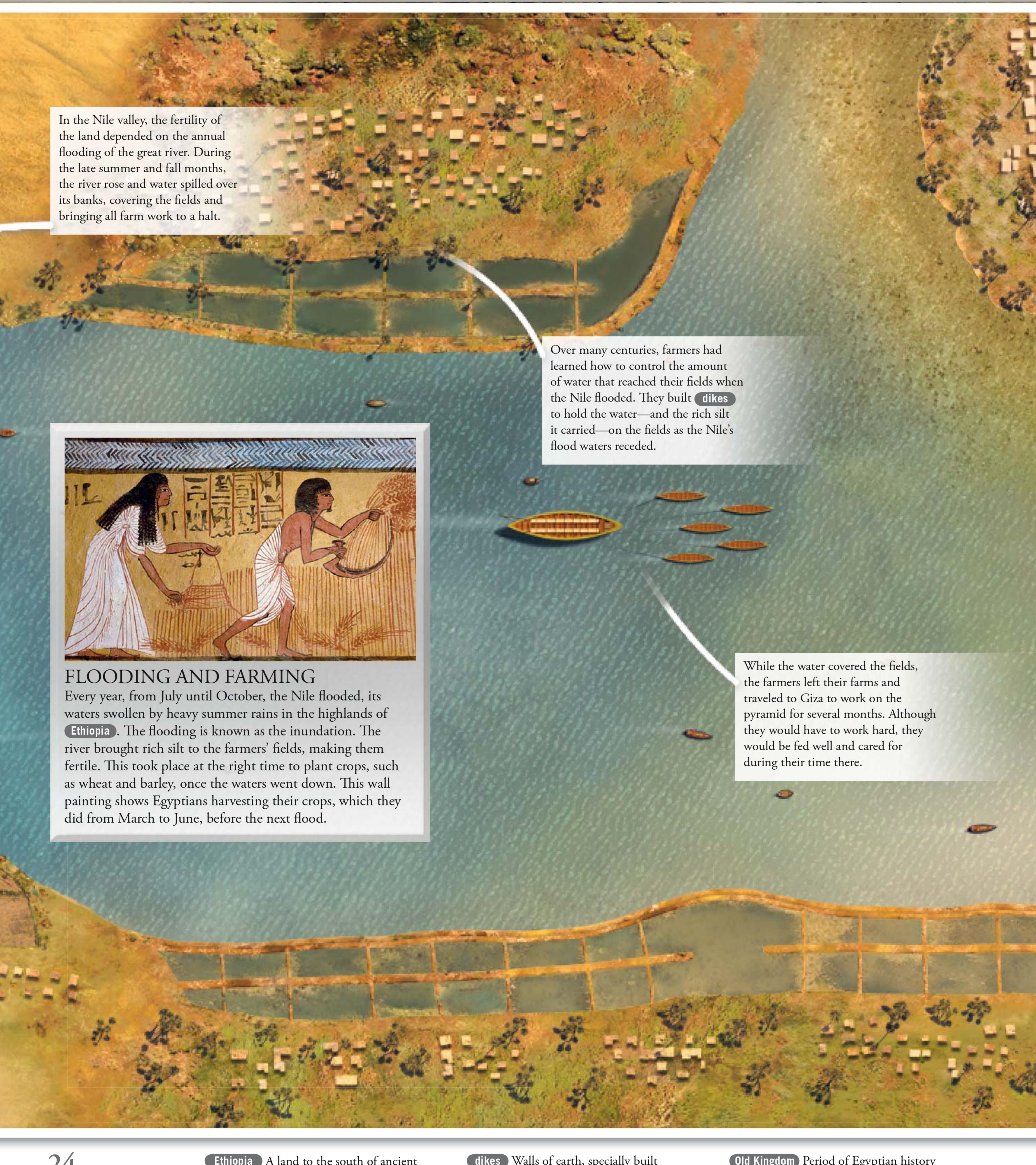
The trip from Aswan to Giza took a couple of weeks. As the barges traveled north, they entered the rich, fertile farmland of the Nile valley. They passed small villages, with their patchwork of fields, as well as great estates and temples to the gods.

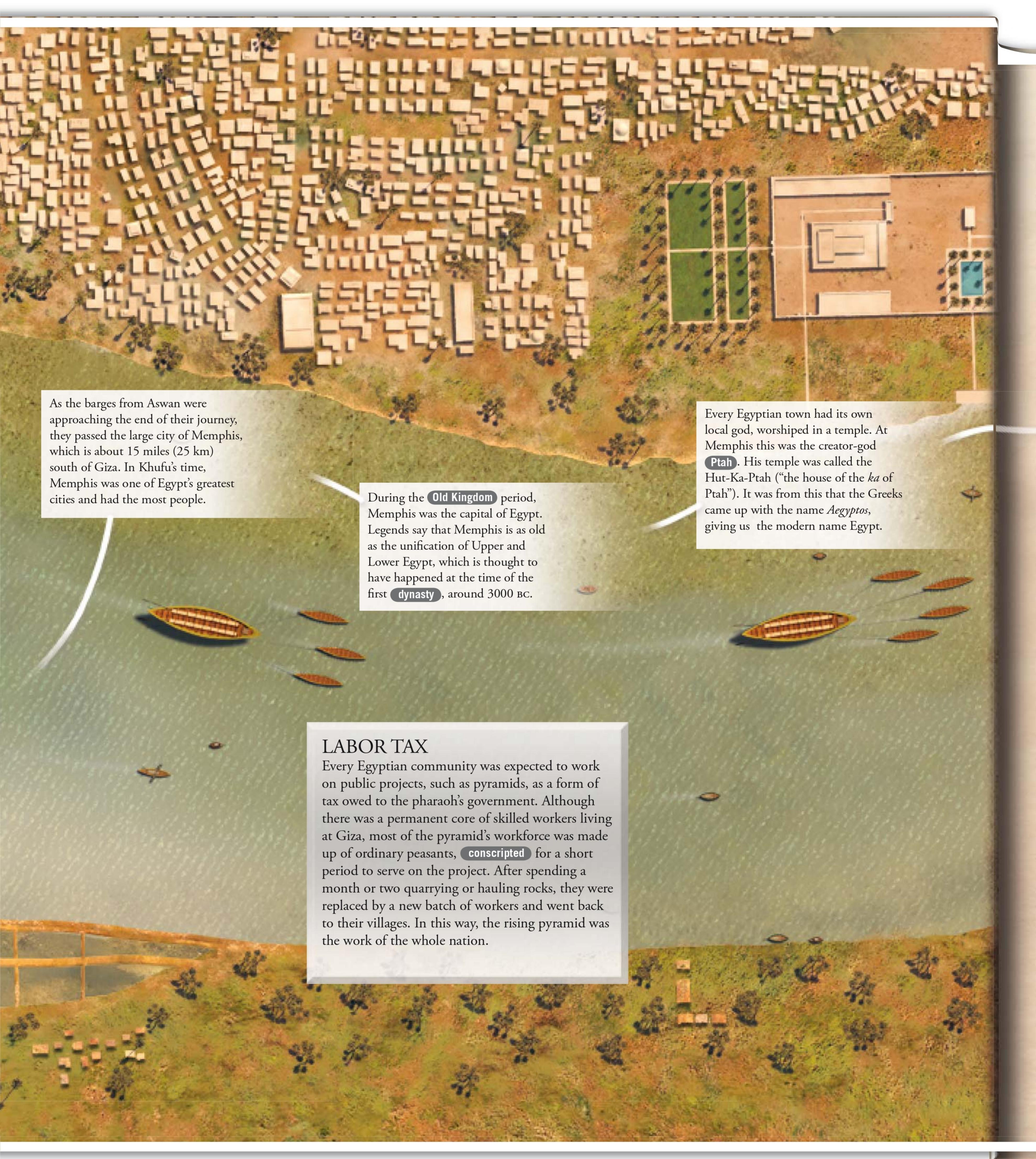
estates Large areas of farmland owned by the pharaoh, noblemen, or temples.

prevailing winds Winds that tend always to blow in the same direction.

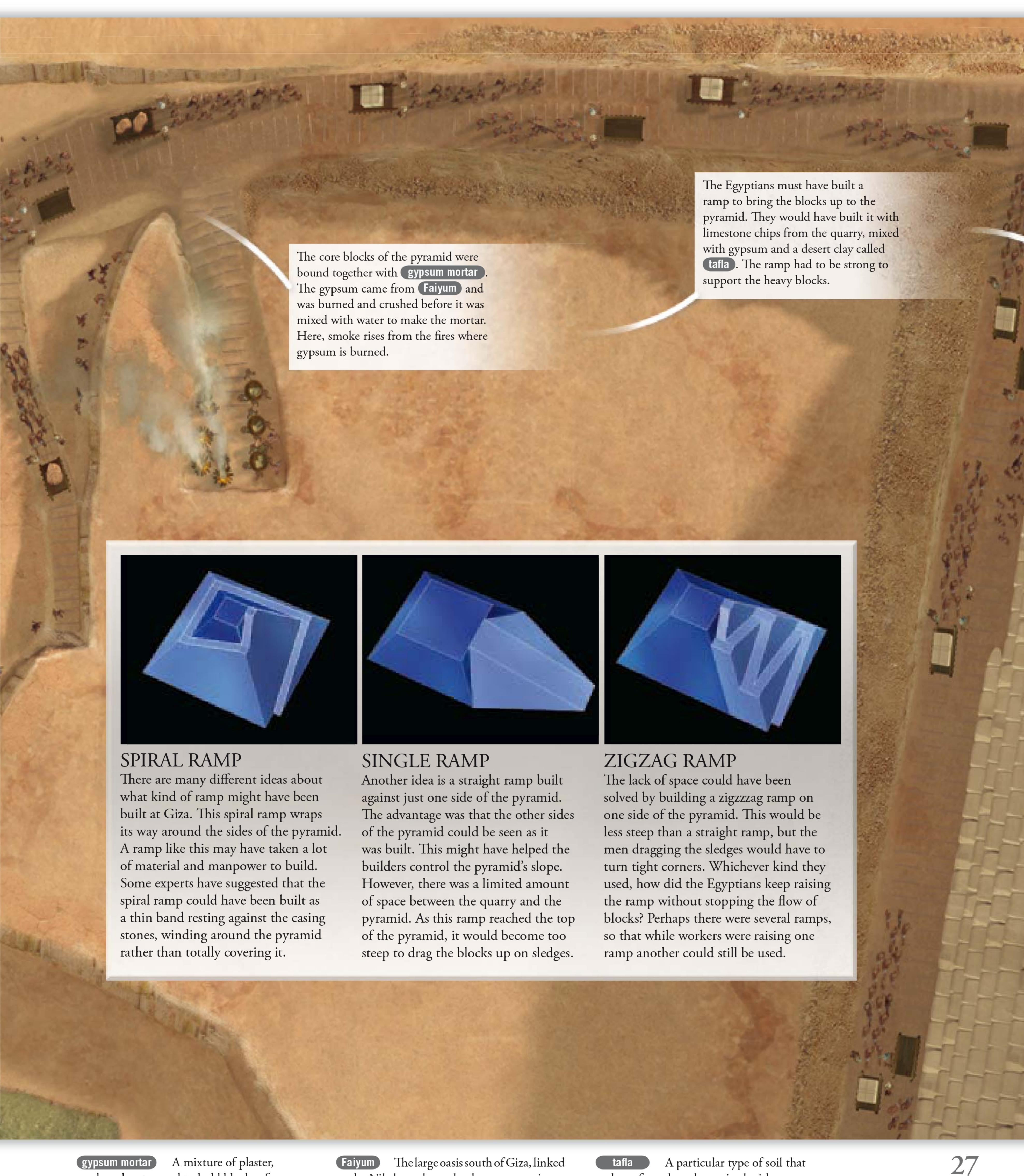
acacia A small spiny tree common in Egypt, with a twisting trunk and branches.

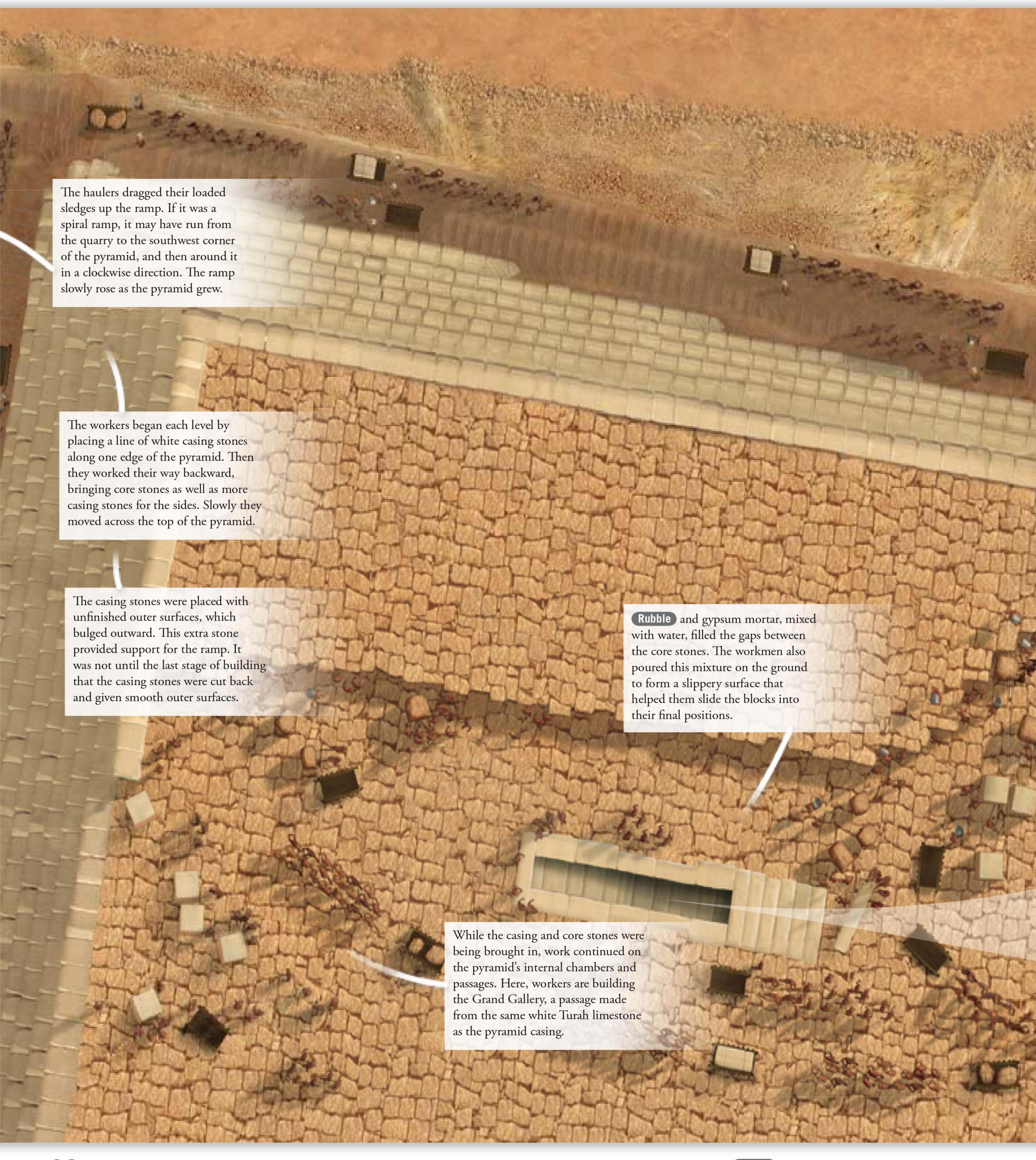
palm trees Trees with large leaves, cultivated for their fruit (called dates), leaves, and husks.



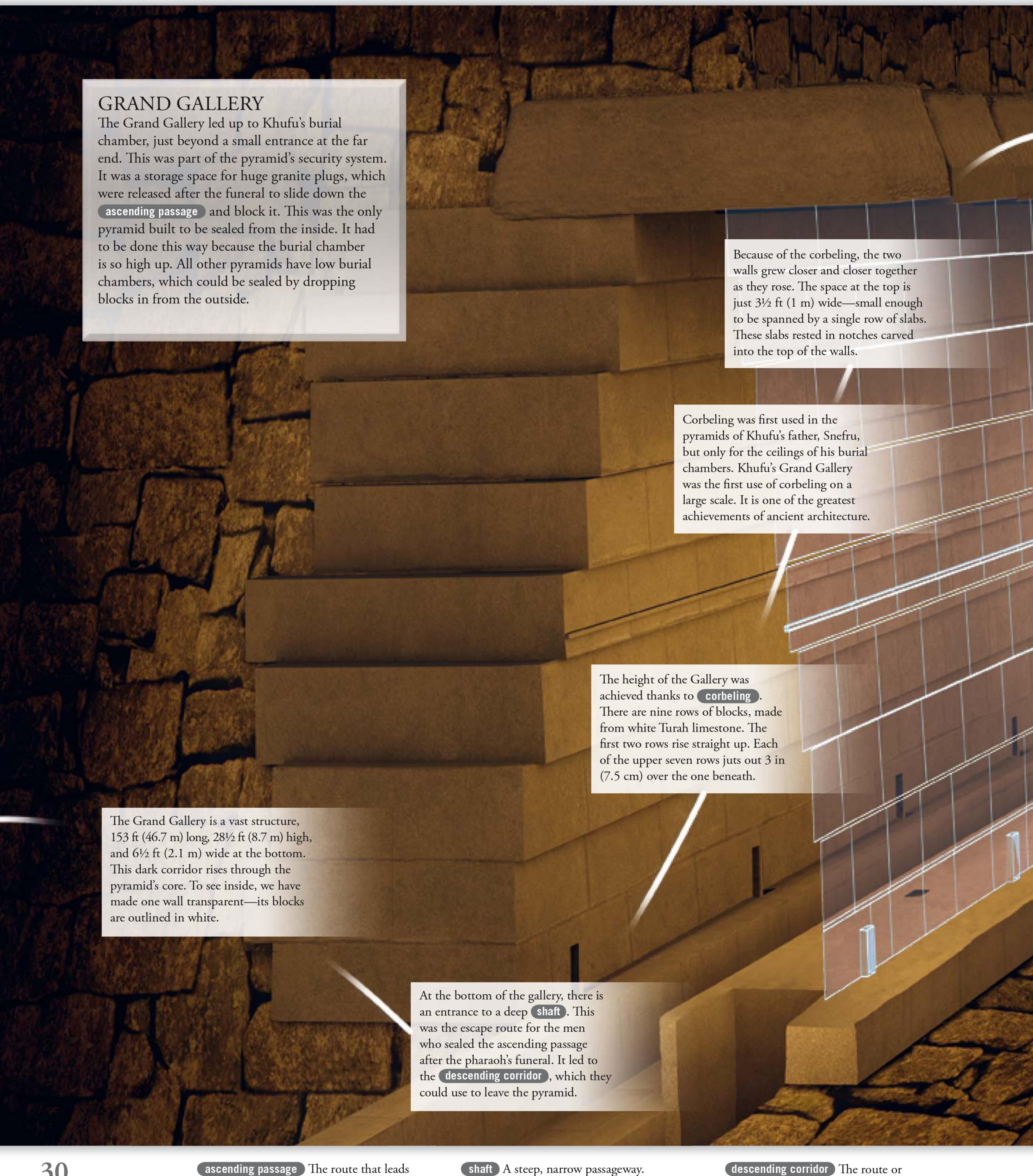


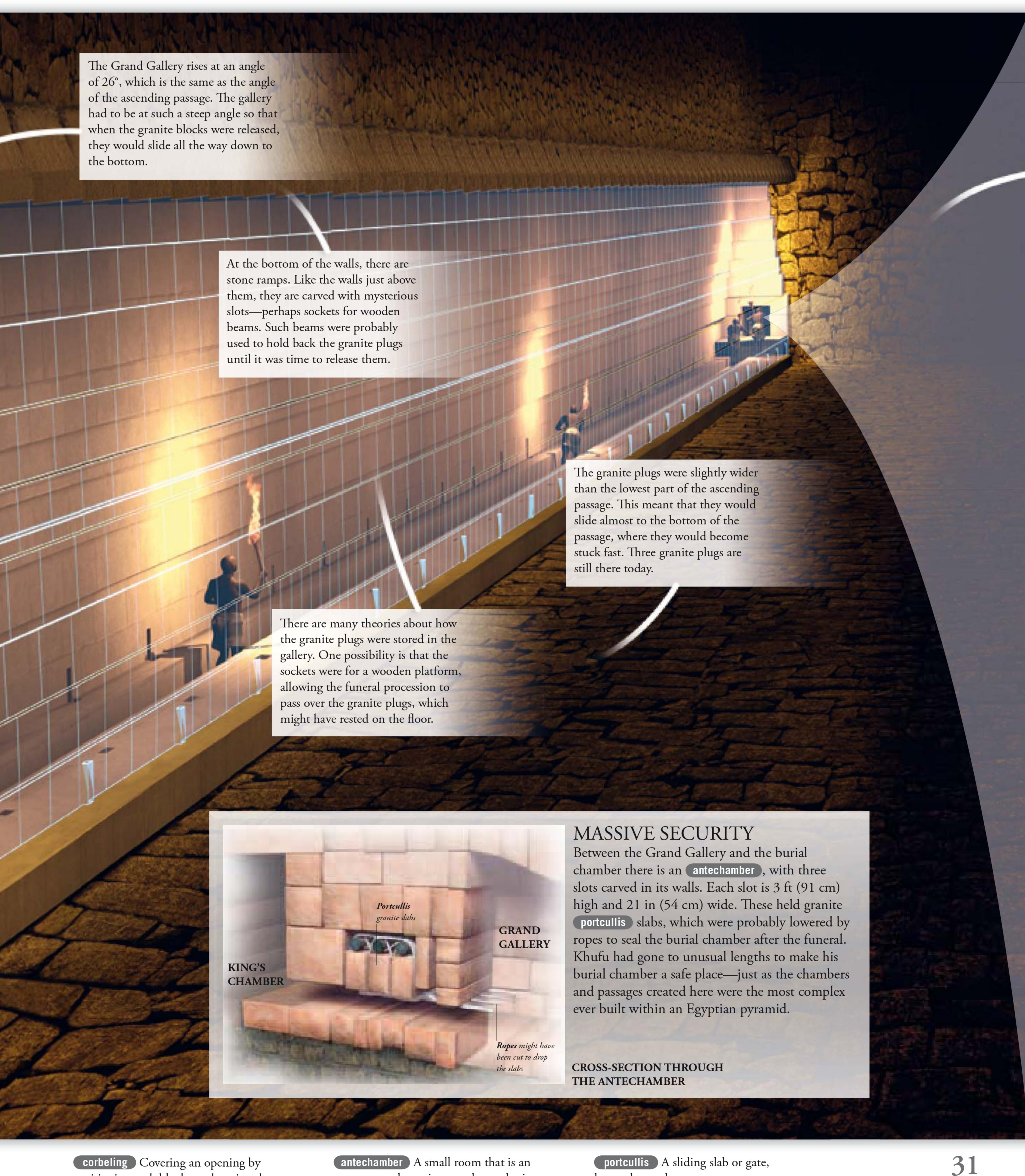


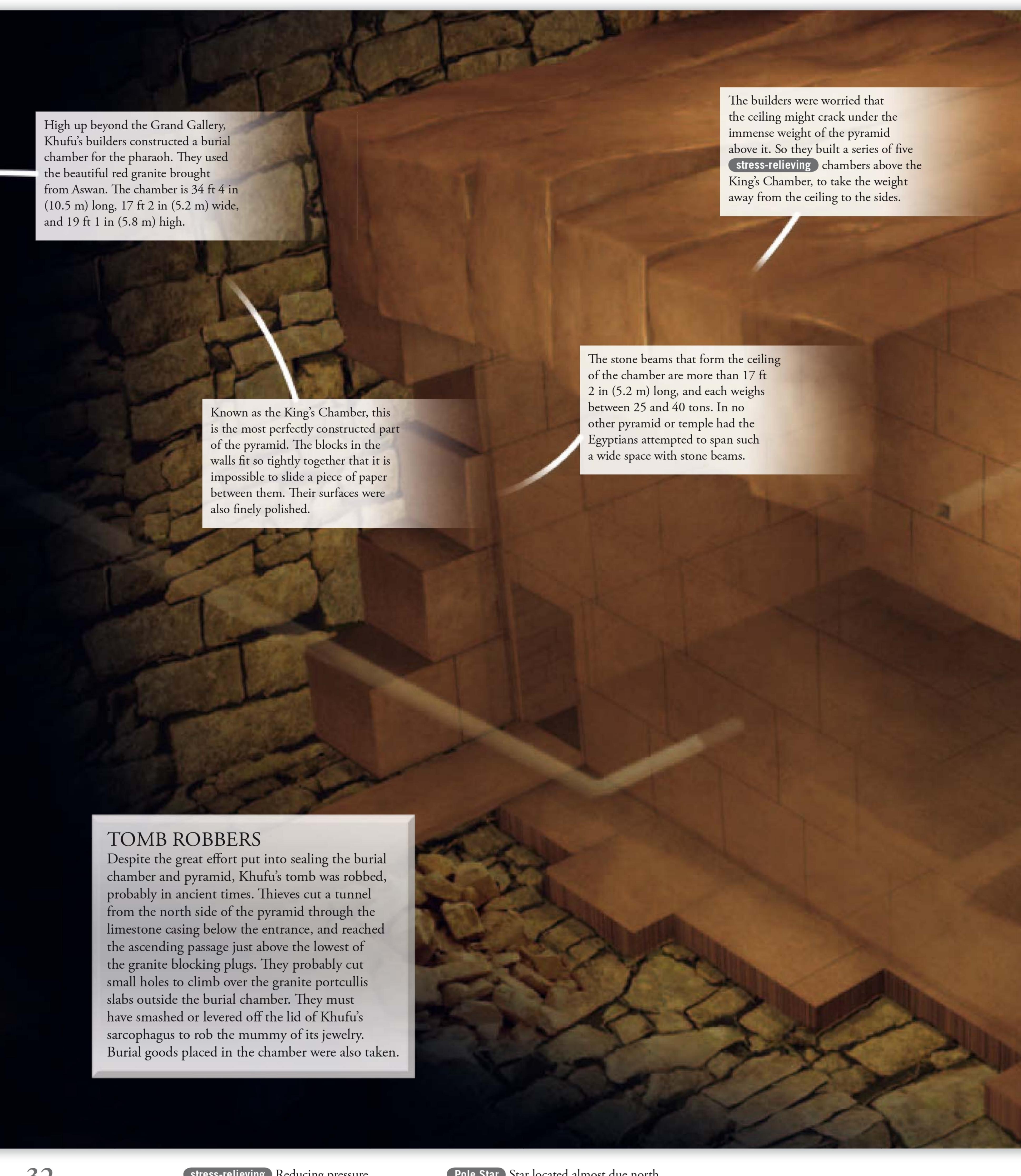


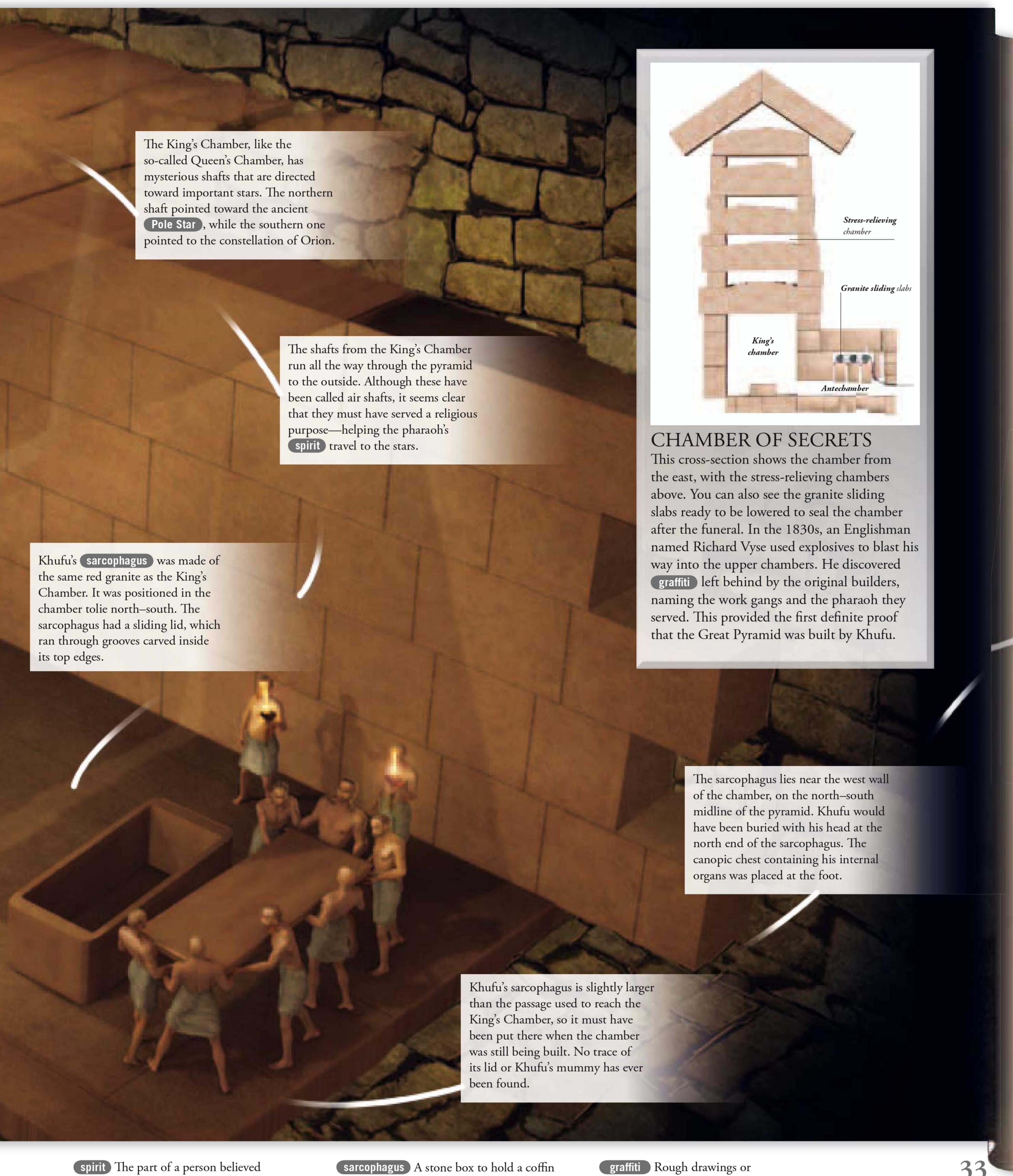












In Egypt you can sometimes see the sun's rays shining down through a break in the clouds at a similar angle to the slope of the pyramid. This suggests that, like the *ben-ben* stone, the complete pyramid was meant to be a model of the sun's rays.

Although the Great Pyramid's capstone has never been found, archaeologists have recently discovered a capstone from a small pyramid that Khufu also built at Giza. This was carved with a convex base, so that it would fit snugly onto concave stones beneath it.

Far above the burial chamber, the pyramid ends in a perfect point. The Egyptian name for the capstone at the top was ben-benet, after the ben-ben. This sacred stone in the temple of Re at Heliopolis represented the sun's life-giving rays. The pyramid itself was probably a copy of the ben-ben stone.



#### SETTING THE CAPSTONE

At the top of the pyramid, there was no longer enough space for the wide ramp used at the lower levels. There are many different theories to explain how the capstone was set. Egyptologist Dieter Arnold has suggested that a small stone stairway was built on one side of the pyramid. The workers brought the capstone up the stairway, perhaps on a wooden frame. They then levered it into place. There may also have been a small wooden platform for them to stand on as they maneuvered the stone into place.

Like the small pyramid's capstone, the Great Pyramid's was probably made from plain white Turah limestone.

Later capstones on other pyramids were carved from hard stones such as black granite. They were highly polished and decorated with religious inscriptions asking for help in the afterlife.

The capstone belonged at the top of the pyramid, nearly 490 ft (150 m) up, so it made a longer and more dangerous journey than any other stone. It was hauled all that way by hand. For the first part of its journey up the pyramid, it was probably dragged up the ramp on a slatted sledge.

For the last part of the journey, workers may have levered the capstone up to the top of the pyramid. Or perhaps they carried the capstone on a wooden frame. Either way, it would have been hard work, because the space the workers had to move in was very restricted so high up.

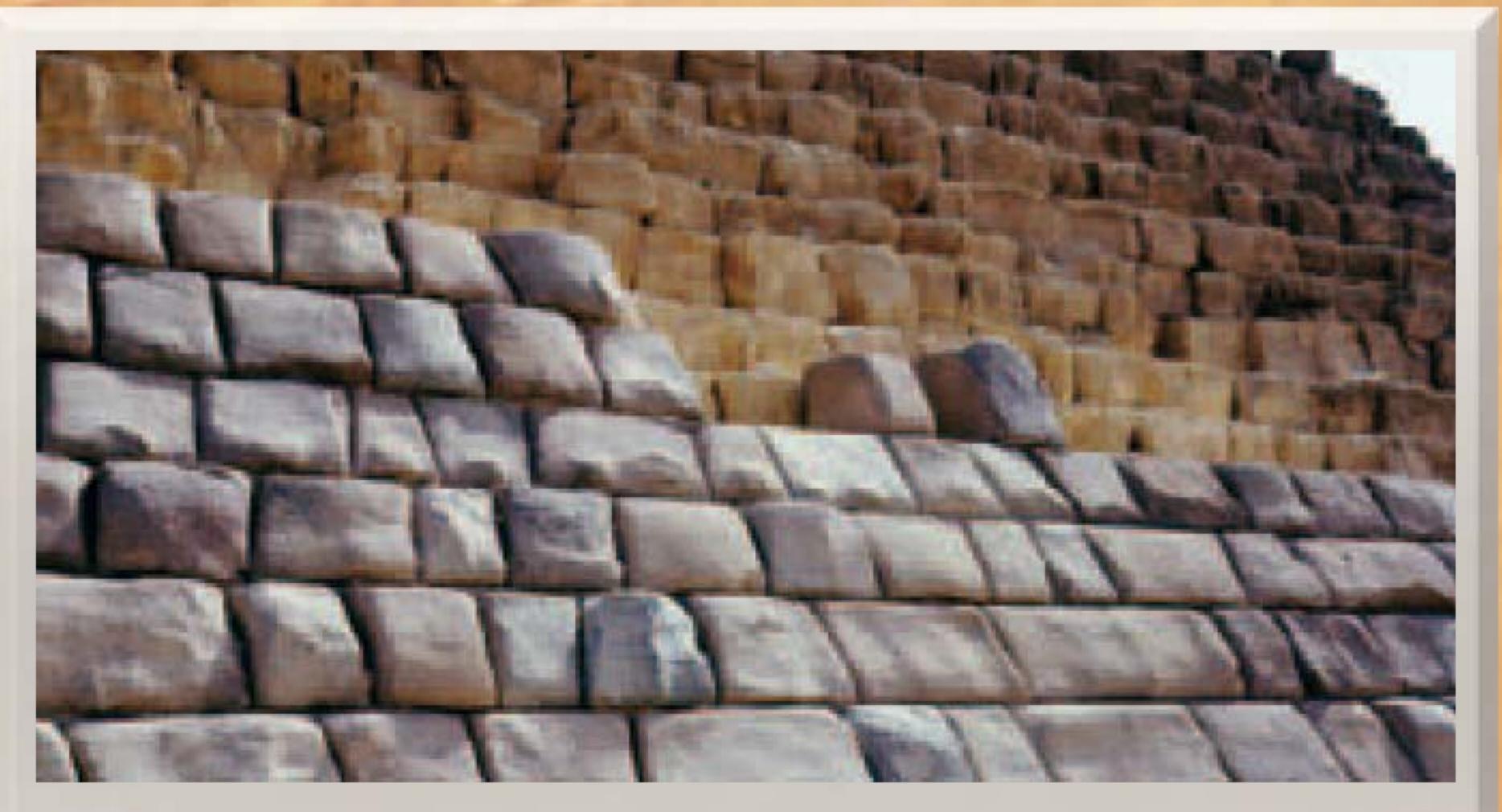


## CELEBRATING THE SETTING OF THE CAPSTONE

The setting of the capstone was reported to the pharaoh, and offerings were made to the gods.

Reliefs on the walls of the causeway at Abusir show scenes of dancers and wrestlers, along with officials and courtiers bowing toward the pyramid, and architects holding papyrus rolls, which may have held the plans for the pyramid itself. The relief shown here is from a later image of dancers and musicians with rattles and tambourines.

When the capstone was in place, the main building phase of the pyramid was finished. This was an important moment, so it was probably marked with great celebrations and religious ceremonies. However, the pyramid was not yet finished—there was still a lot more work to be done.



#### SMOOTHING THE STONES

The pyramid built by Khufu's grandson, Menkaura, was left unfinished, perhaps because the pharaoh died before the end of construction. On its lower level today, it still has rough, undressed casing stones. This is good evidence that the pyramid was dressed from the top down. Where blocks have fallen away, the lines guiding the stonecutters can be seen on the sides of the casing stones. Since this method was used by Khufu's grandson, it may have been used by Khufu's builders as well.

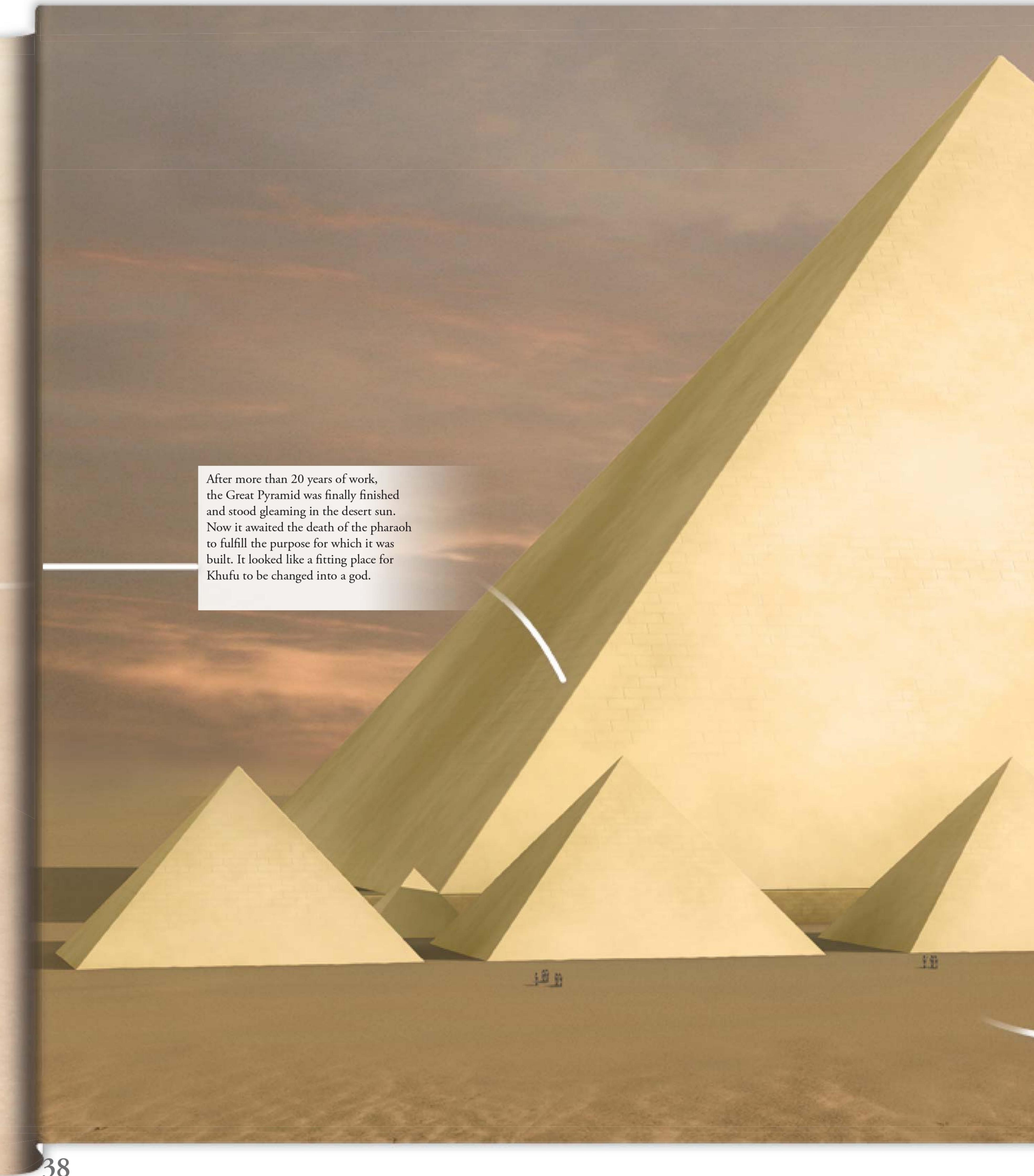
As they worked their way down, the men might have stood on the projecting casing stones below them. They could also have used simple scaffolding made from light poles tied together with plant rope, as shown in Egyptian wall paintings.

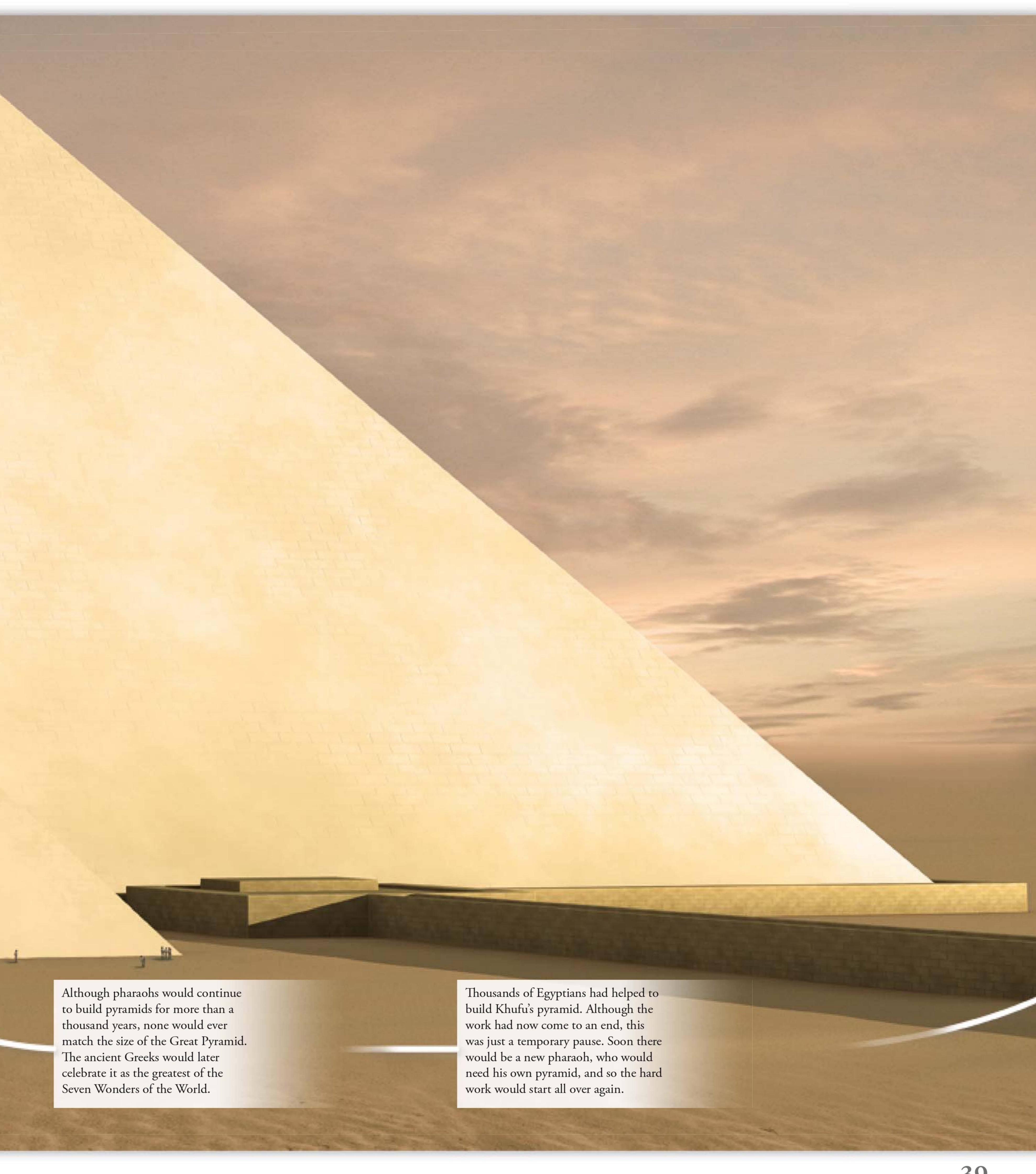
Once the capstone was in place and celebrations finished, the stonecutters could begin to dress the casing stones. Workers also began to take down the enormous ramp they had used to bring the stone blocks and other materials up the pyramid.

The stonecutters were extremely skilled, working accurately to give each block a flat surface. When they finished, a different team of workers polished the blocks' surfaces by rubbing them with stones. This smoothed away the chisel marks, and made the stones gleam.

To cut away the stone sticking out from the angle of the pyramid's face, the stonecutters used small copper-bladed chisels. They were guided by the shape of the finished stones above, and by lines marked on the sides of the casing stones.









Groups of wailing women mourned a pharaoh's death at his funeral, which was a time of great sorrow. This wall painting is inside a tomb dating from around 1370 BC.

broken, and this connection had to be restored. It was remade through rituals that placed Khufu in heaven and transferred his power to his son, Radjedef, the new pharaoh. The pyramid was the place where Khufu was changed into Osiris, and safely established in heaven.

"He is on his way to heaven, on the wind. He is not hindered; there is no one by whom he is hindered."

Pyramid texts: Utterance 258, 2350–2150 BC

#### Pyramid texts

The burial chambers of later pyramids have magic spells written on the walls, designed to help the pharaoh change into Osiris and get to heaven. These spells, known as pyramid texts, take the form of hundreds of utterances, or sayings. There are none in Khufu's burial chamber, but they were probably spoken at his funeral by Radjedef or a priest.

#### EXPLORING THE PAST

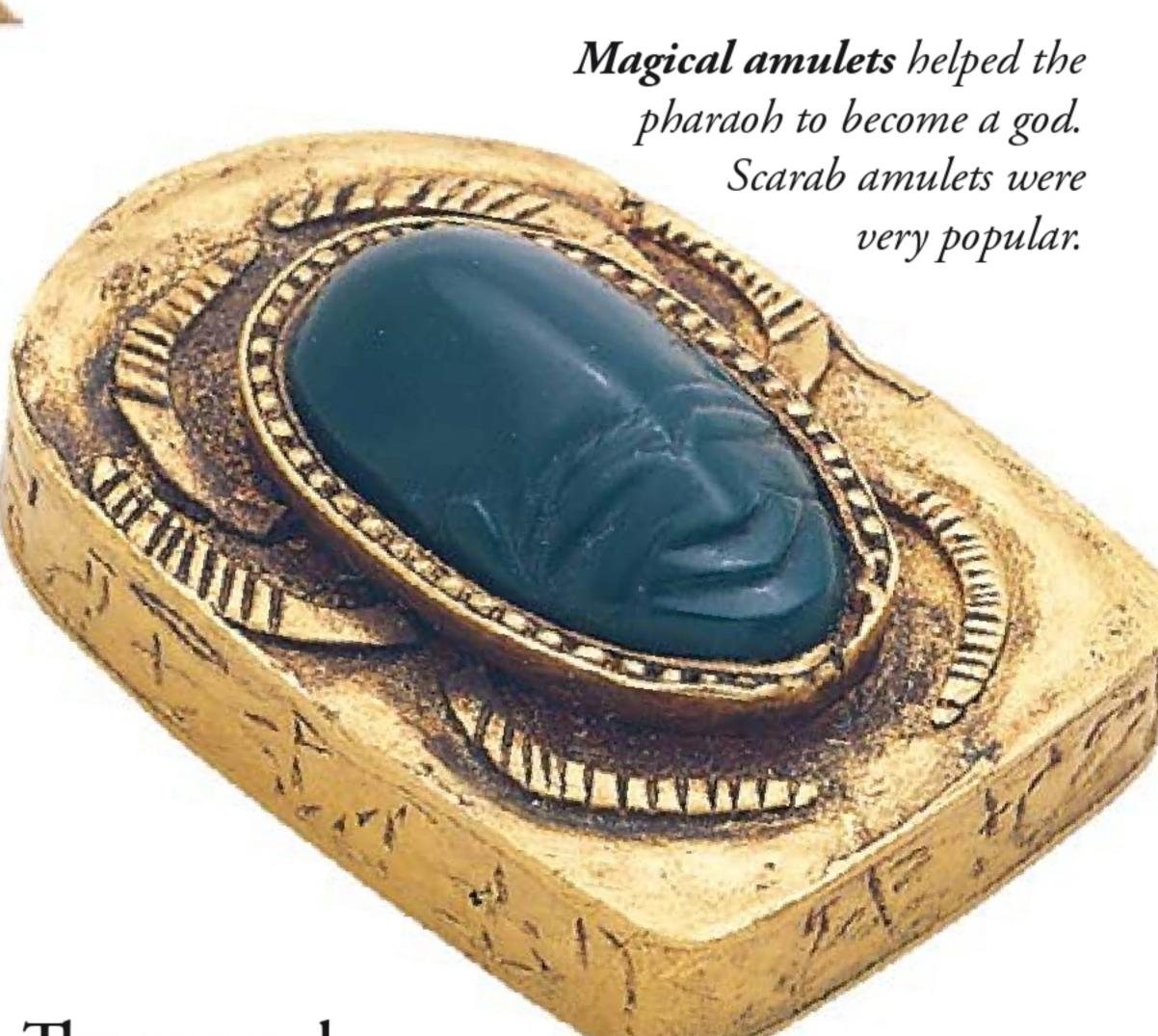
# THE PHARAOH DIES

FUNERAL FOR A GOD

he death of a pharaoh, such as Khufu, was the most important event that could take place in ancient Egypt. For the pharaoh was no ordinary king. On Earth he was seen as the human form of the falcon-headed sky god, Horus. After death, he changed into Osiris, king of the dead and the father of Horus, and the new pharaoh replaced him on Earth as Horus.

#### Vital link

The living pharaoh provided a link between life on Earth and the gods, who made sure that all existence continued. It was thanks to the pharaoh that the sun rose every morning and the Nile River flooded at the right time so that crops could be grown. When Khufu died, the link between humanity and the gods was temporarily



The sun god

During Khufu's reign, the sun god Re became the most important Egyptian god. The pharaoh was now linked with Re as well as Osiris. So, unlike Djoser's Step Pyramid complex, which faced toward stars in the north, Khufu's pyramid complex was built facing east, toward the rising sun.



### "Osiris dawns—pure, mighty, high, lord of truth."

Pyramid texts: Utterance 577, 2350–2150 BC

#### Sailing through the heavens

The Egyptians believed that Re traveled across the sky in a boat. At sunset, he passed below the western desert to the underworld. He then sailed back beneath the Earth, to reemerge at sunrise on the eastern horizon. This was the place where Re was reborn each morning. It was also where the dead pharaoh, riding in the boat of Re, first emerged as a god. This is why Khufu's pyramid was called *Akhet Khufu*, which means "the Horizon of Khufu."

#### Spirit forms

Ancient Egyptian ideas about life and death were complex. Everyone was thought to be made of

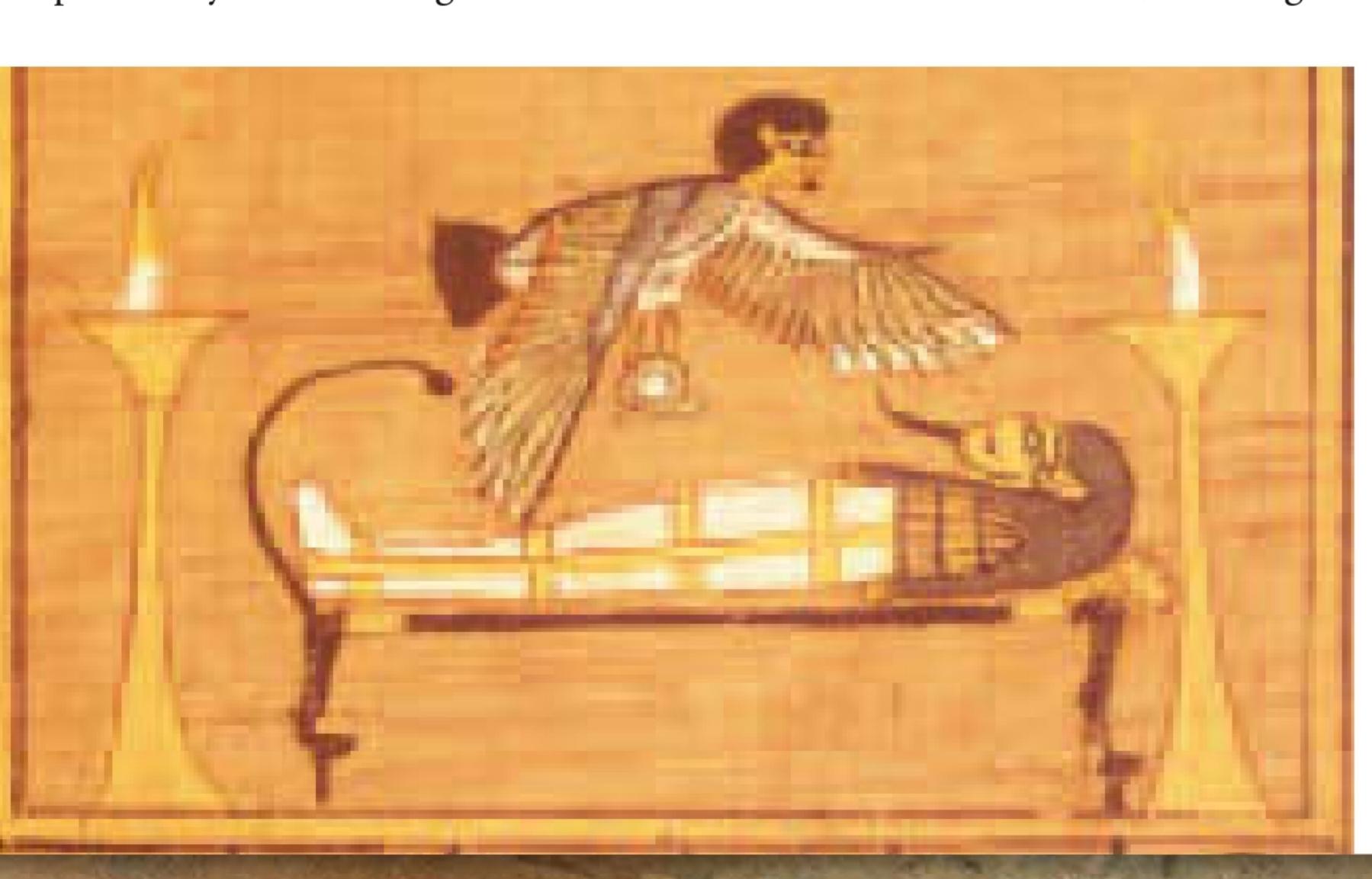
Ancient Egyptians thought of all journeys as being made by water. Just as Re crossed the sky in a boat, coffins were often taken to tombs on a boat resting on a sledge.

several parts, which all had to be protected after death. First, there was the physical body, which was preserved as a mummy—a perfect new body to last forever. There were also two spirit forms—the ka and the ba. The ka was the life force, which needed food to survive. A pharaoh's ka could enter his statues and receive food offerings on his behalf. The ba represented his ability to move around. So Khufu's *ba* could move between his mummy, high up in his pyramid, down to his temples to visit the ka statues, or travel up toward the stars. At the moment of death, the ka, ba, and body separated. They were brought back together during the funeral rituals. The ka and the ba now united as a third spirit form—the akh, meaning "shining light."

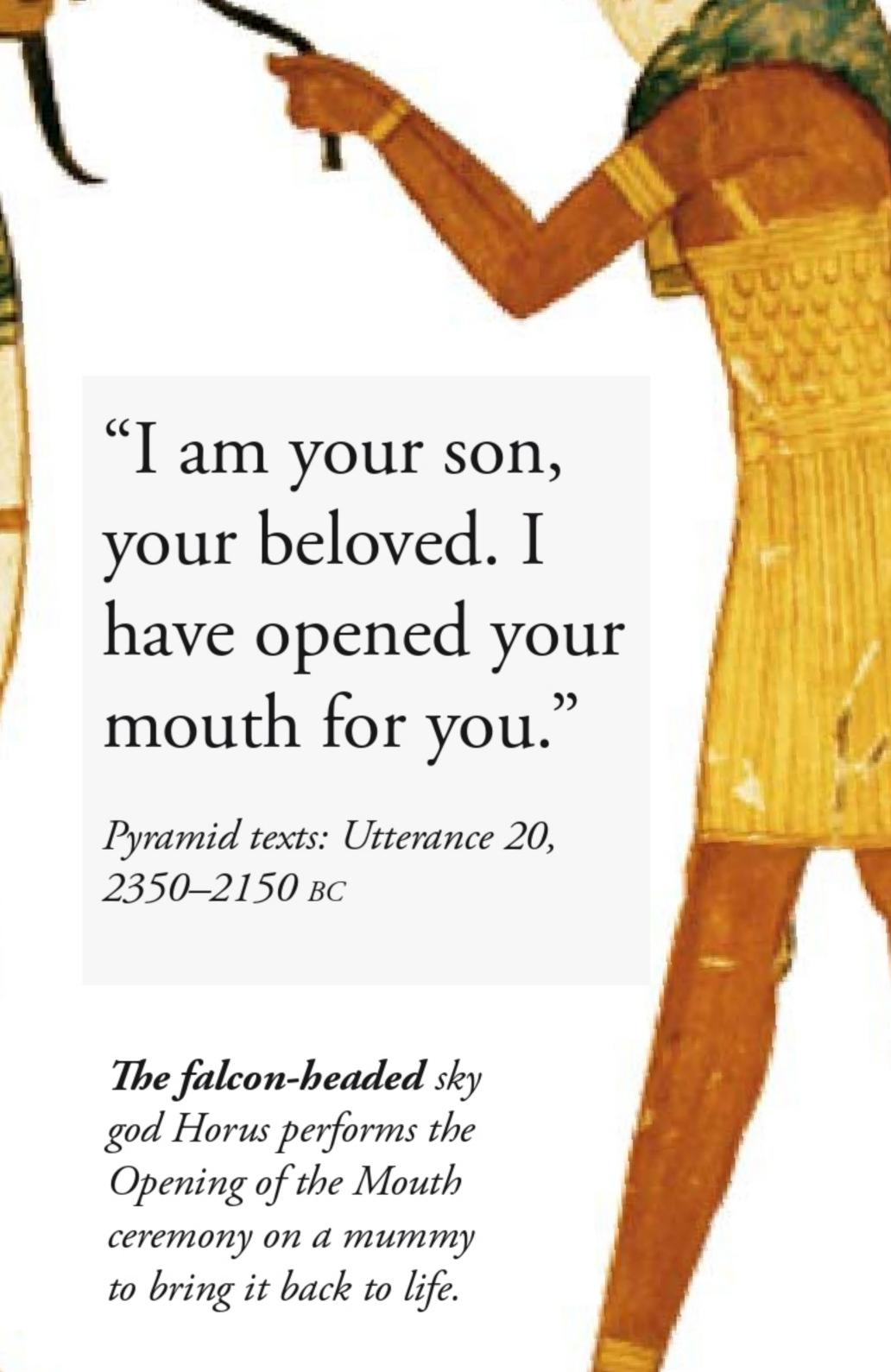
#### Funeral ceremonies

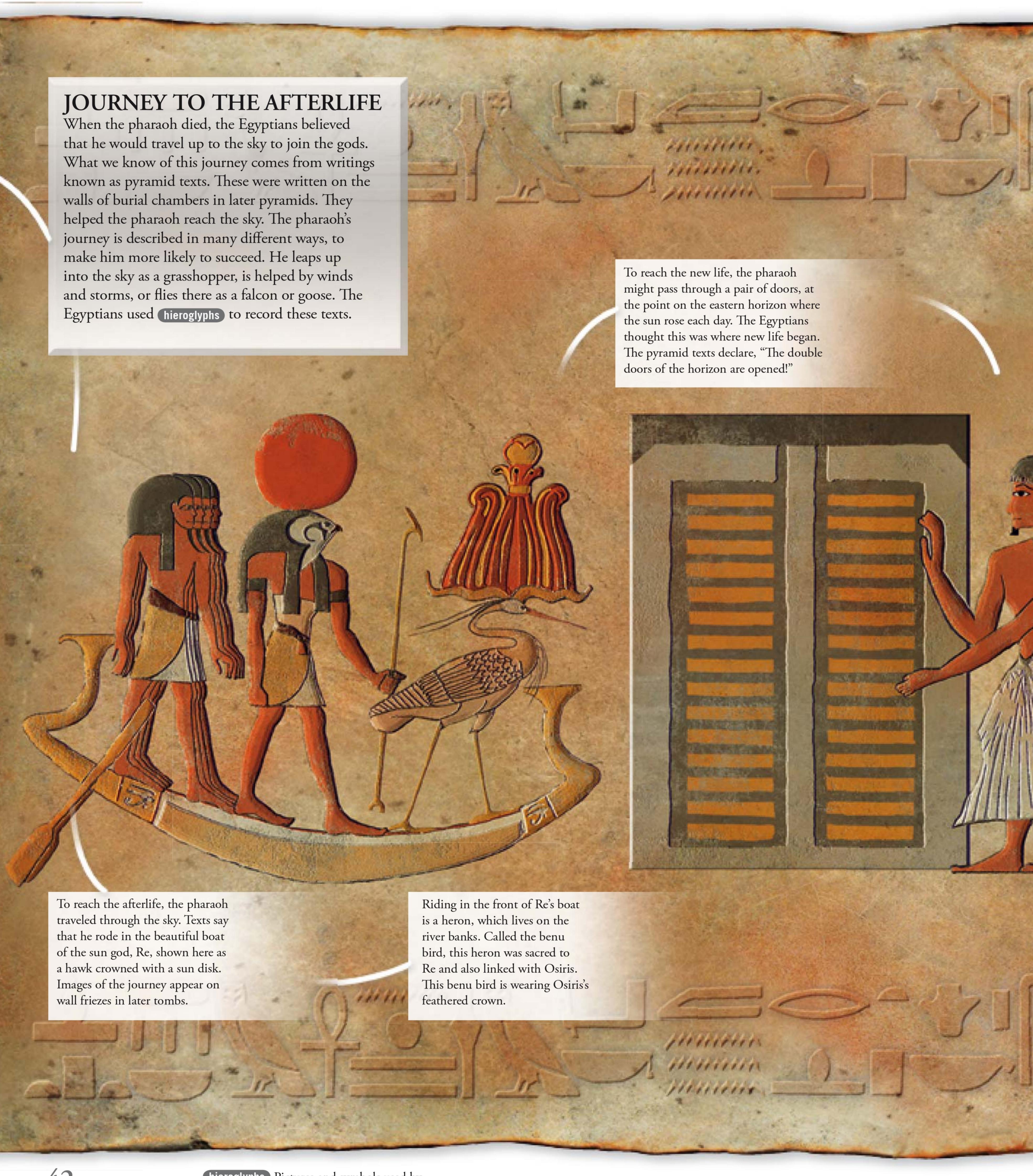
The central act performed by Radjedef at his father's funeral was called "the Opening of the Mouth." Playing the role of Horus, he brought his father back to life by magic. While reciting spells, he touched various parts of Khufu's mummy or *ka* statue with special tools, magically restoring all his father's bodily functions. Now Khufu could eat, breathe, and see again. He was ready to begin

his new life in the next world.

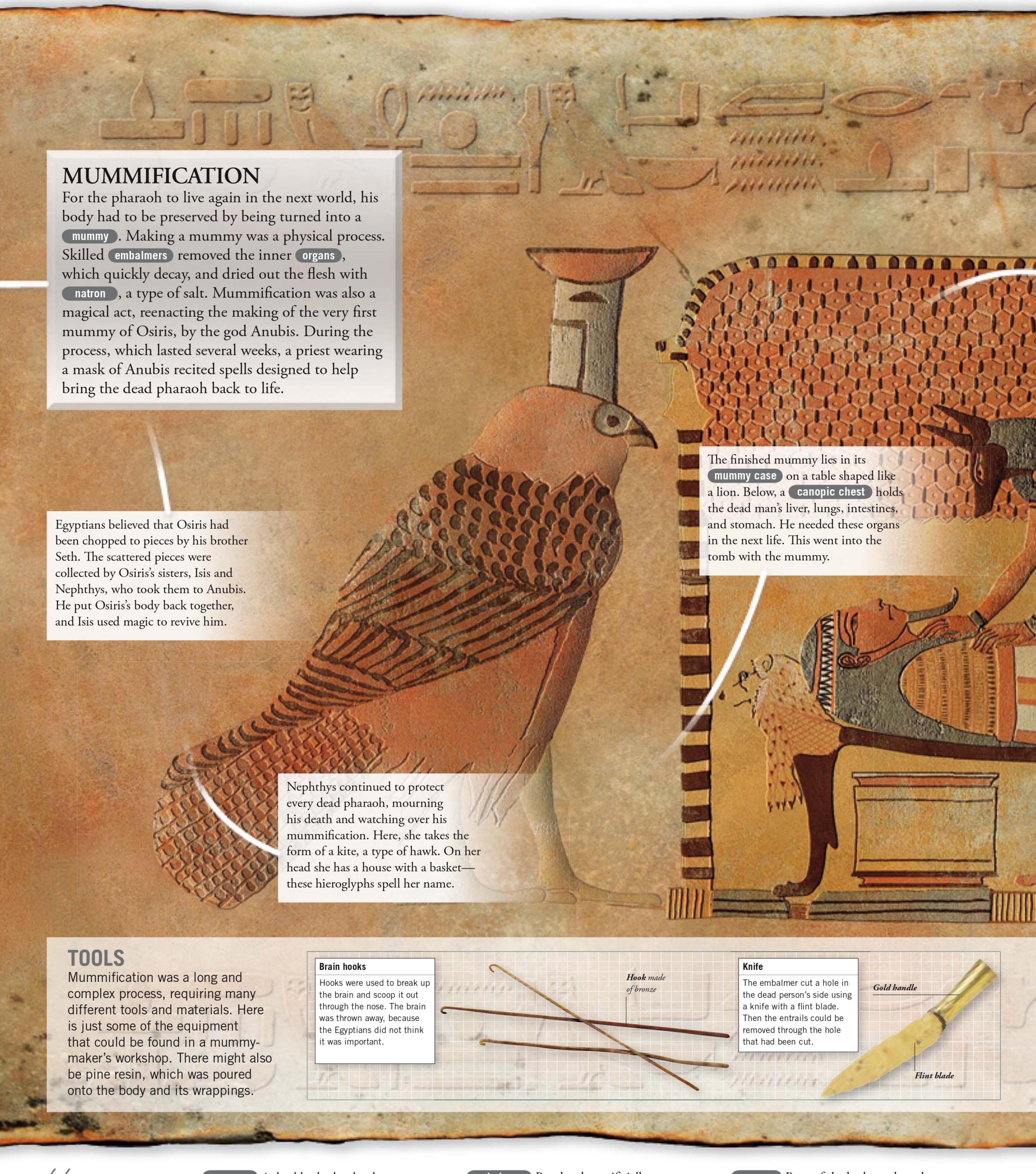


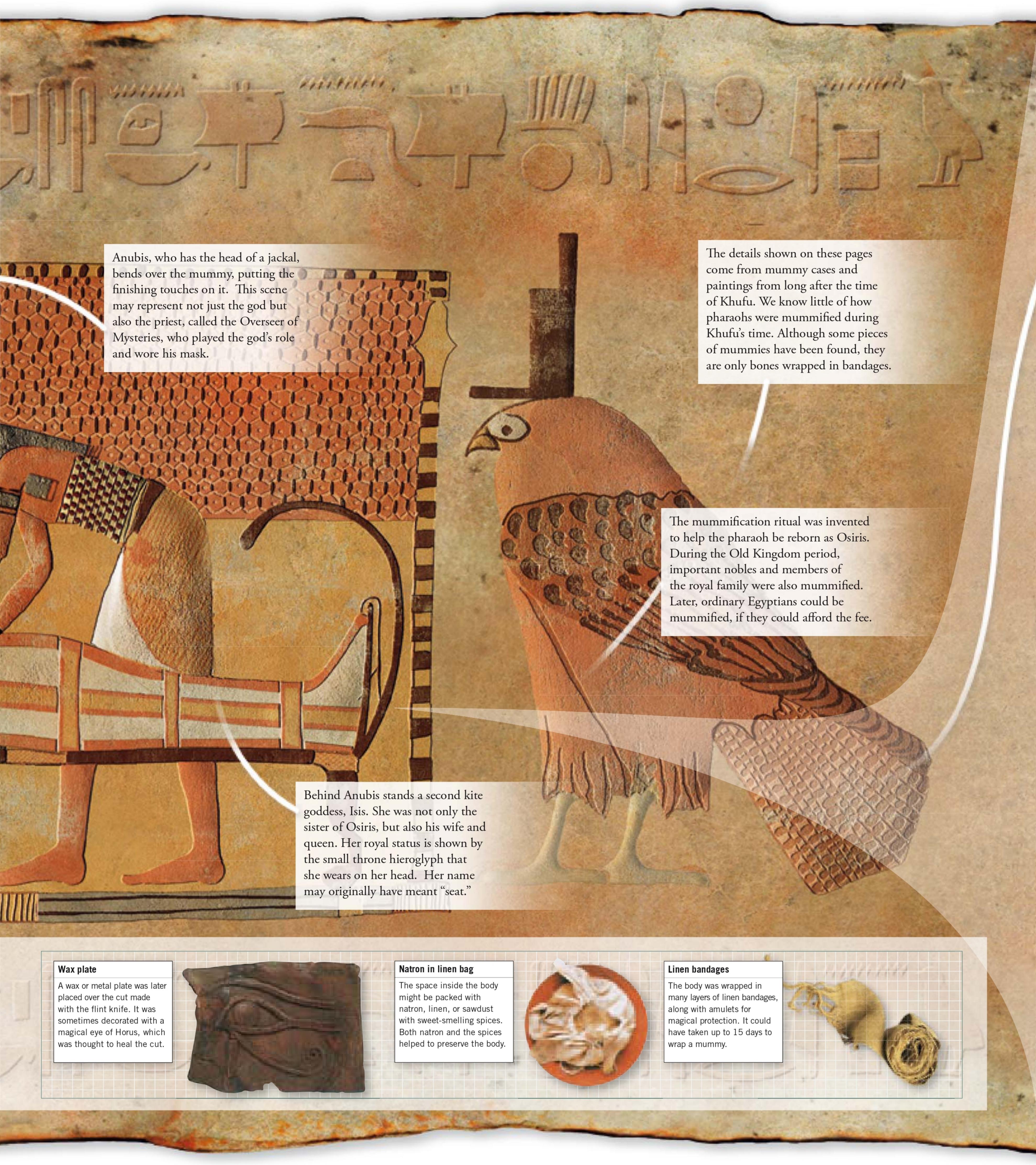
The ba spirit
was pictured as
a human-headed
bird. In this
papyrus painting,
it hovers in
midair over
its mummy.











natron Moisture-absorbing salt used in ancient Egypt to dry out a corpse. The salt comes from dried lake beds.

mummy case A container for a mummy. In Khufu's time, these were plain boxes. Later they resembled mummies.

canopic chest Box divided into four sections for storing embalmed organs. Later, the organs were stored in canopic jars.

#### A TRANSPARENT 3-D MUMMY

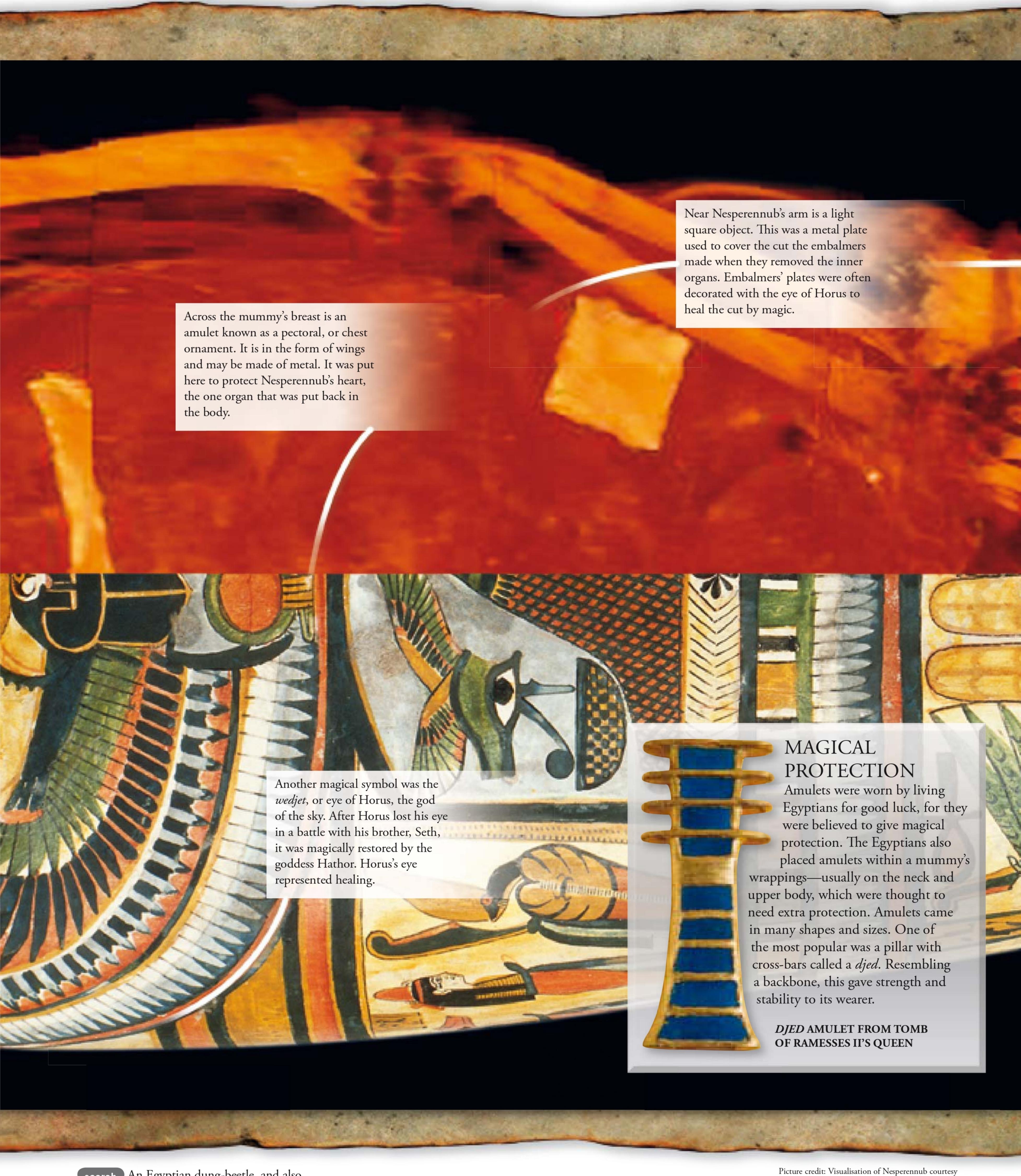
In the past, the only way to examine a mummy was to unwrap it, usually destroying it in the process. Now Egyptologists can use CT to look inside a mummy's wrappings without even opening the wooden mummy case. The scans help us to understand the mummification process. This is the mummy of a man who died around 800 BC. His teeth reveal that he was in his early forties. The writing on his mummy case says that he was a priest called Nesperennub, who served in the temple at Karnak.

The CT scans reveal a rough clay bowl behind the mummy's head. This was probably left here to catch the resin smeared over Nesperennub's skin. Perhaps the embalmers left the bowl in place for too long—when the resin dried hard, it glued the bowl to Nesperennub's head.

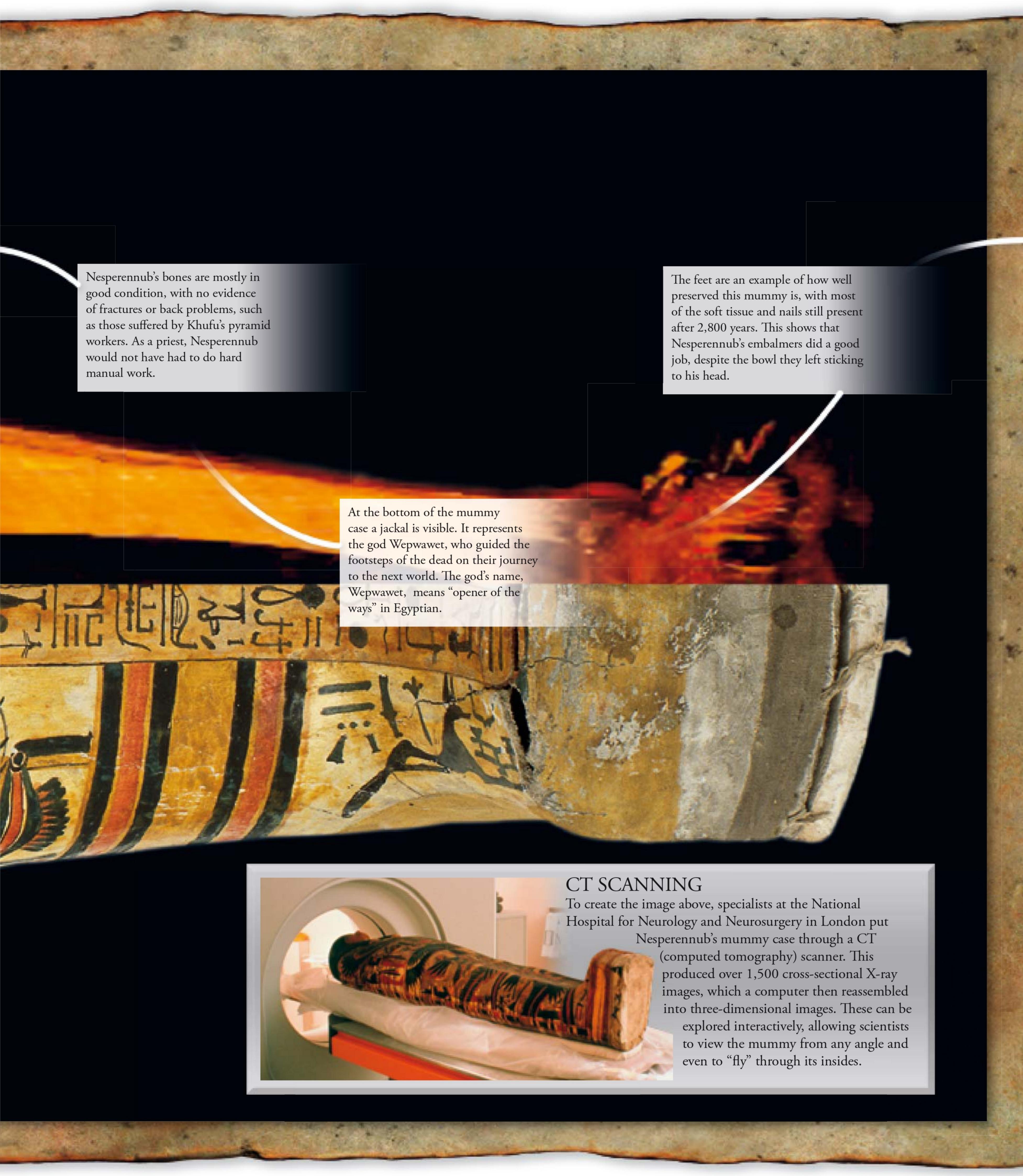
The mummy's eye sockets contain artificial eyes, probably made from stone or glass. Human eyes could not be preserved by mummification. Damage around the nose shows where the brain was pulled out by the embalmers, using metal hooks.

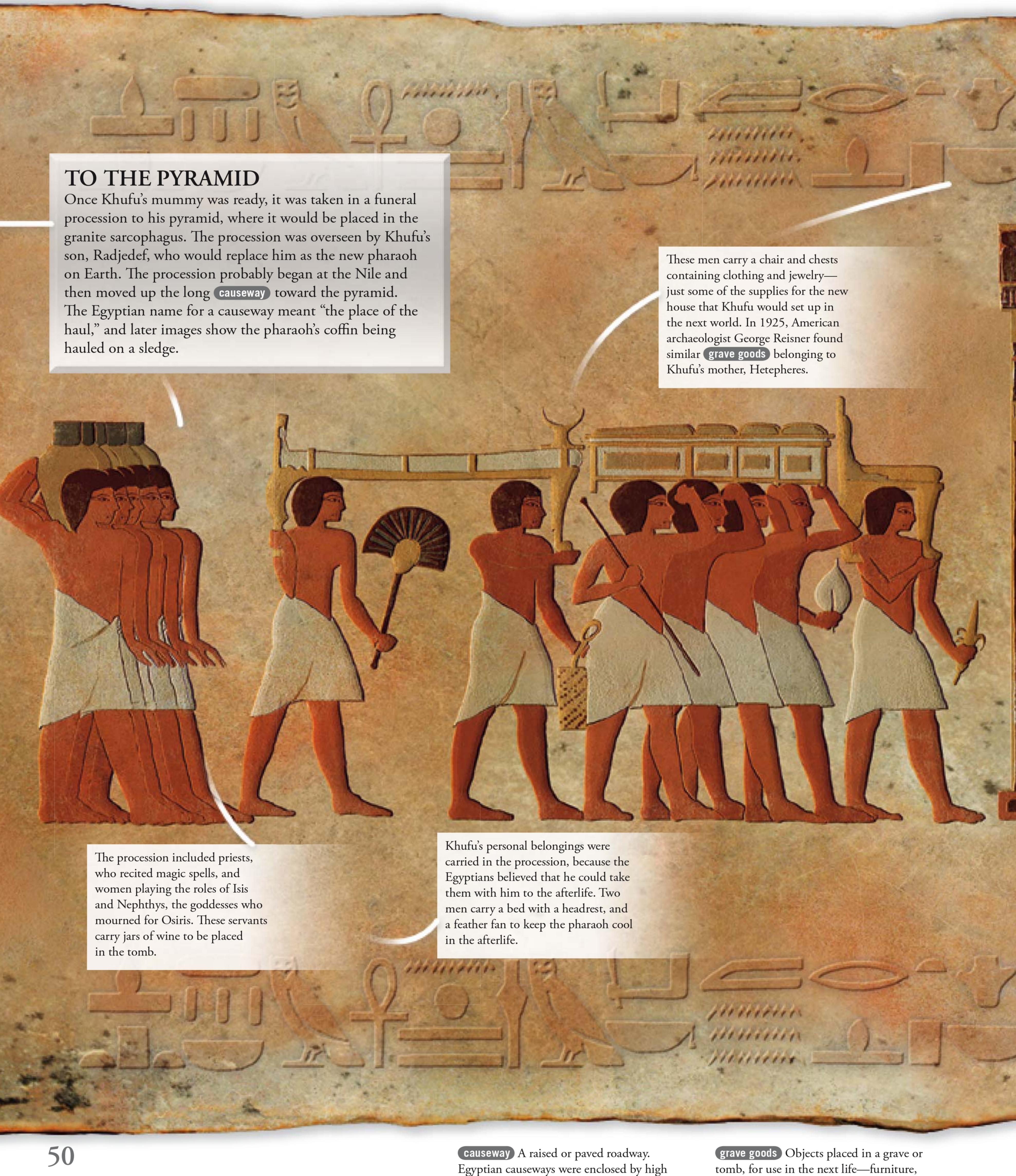
The mummy case has a portrait of Nesperennub, shown as a young man with a peaceful expression and a long, dark wig. This was an idealized portrait of Nesperennub, and probably bore little resemblance to the real man.

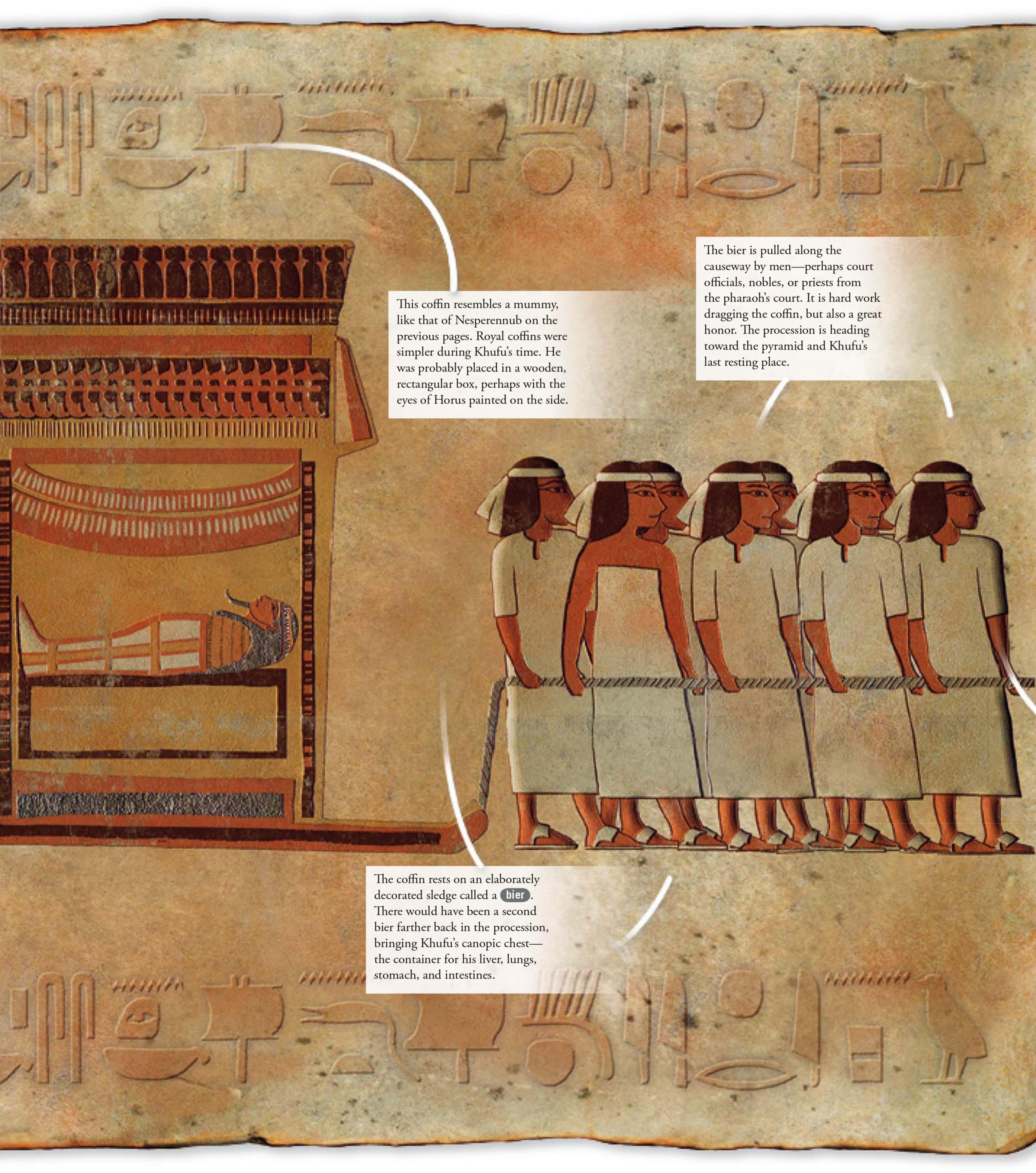
The mummy case is covered with magical symbols, including a scarab with beautifully painted wings that wrap around Nesperennub's upper body. The scarab represented rebirth, while the stretched-out wings are protective.

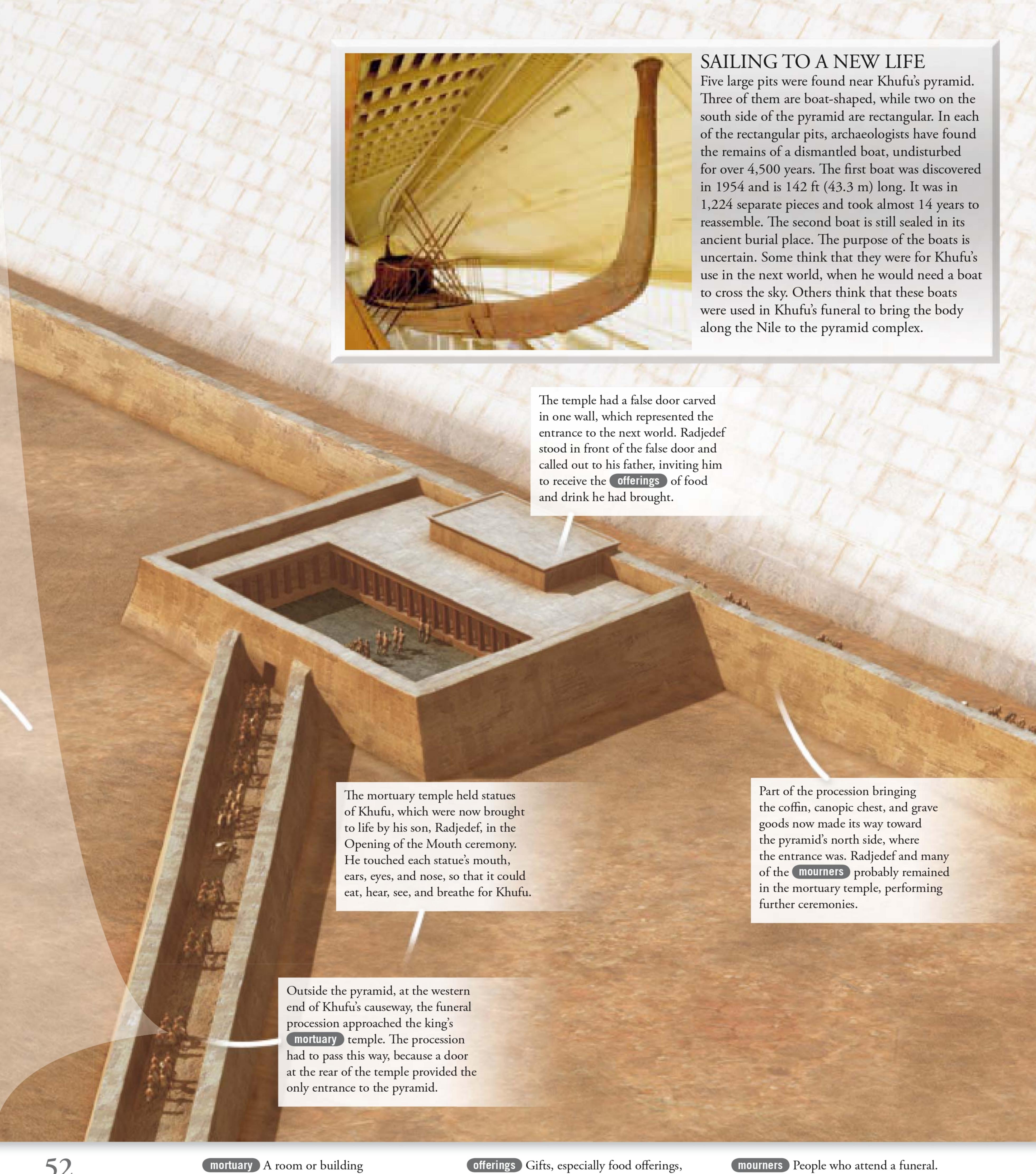


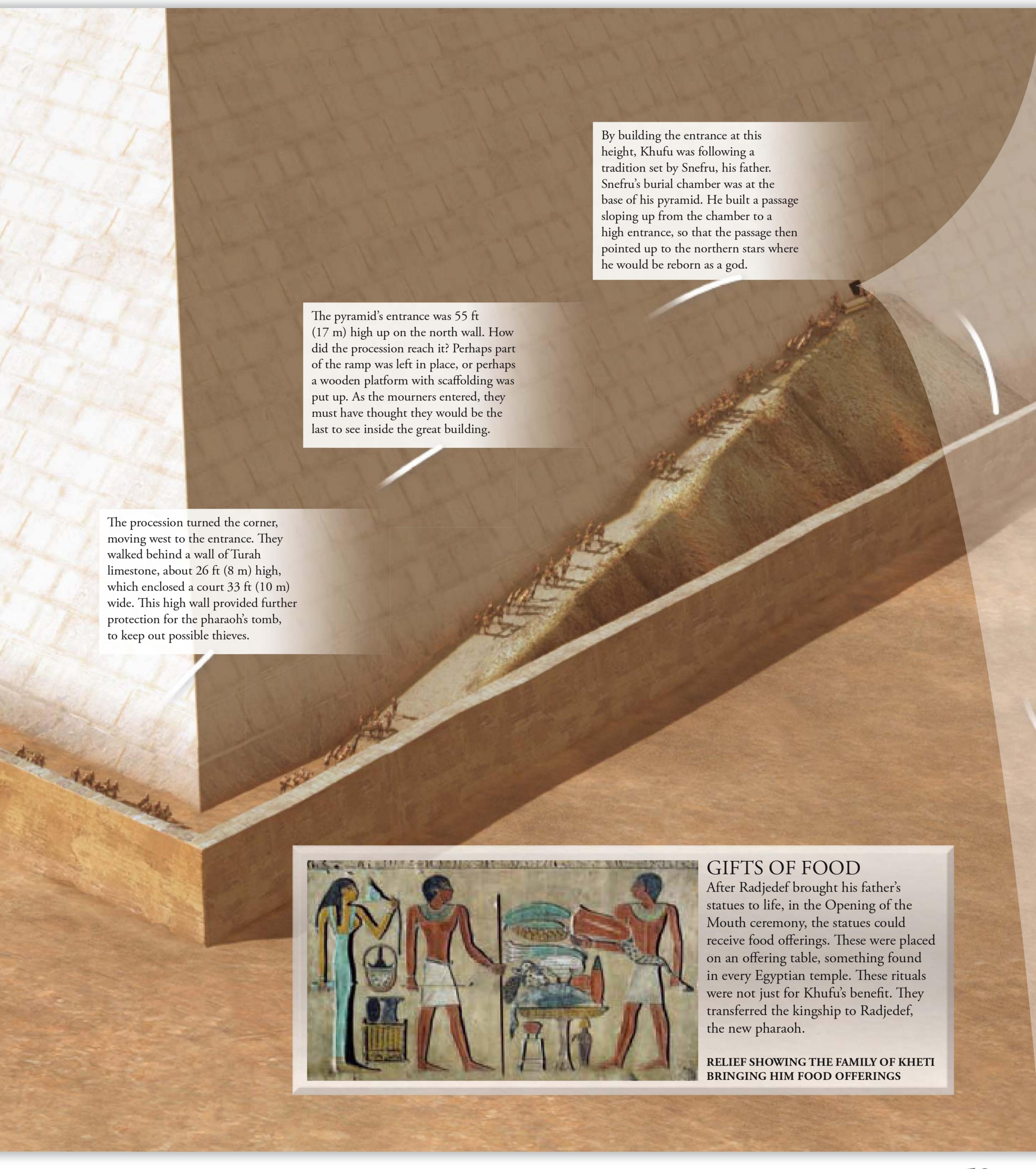


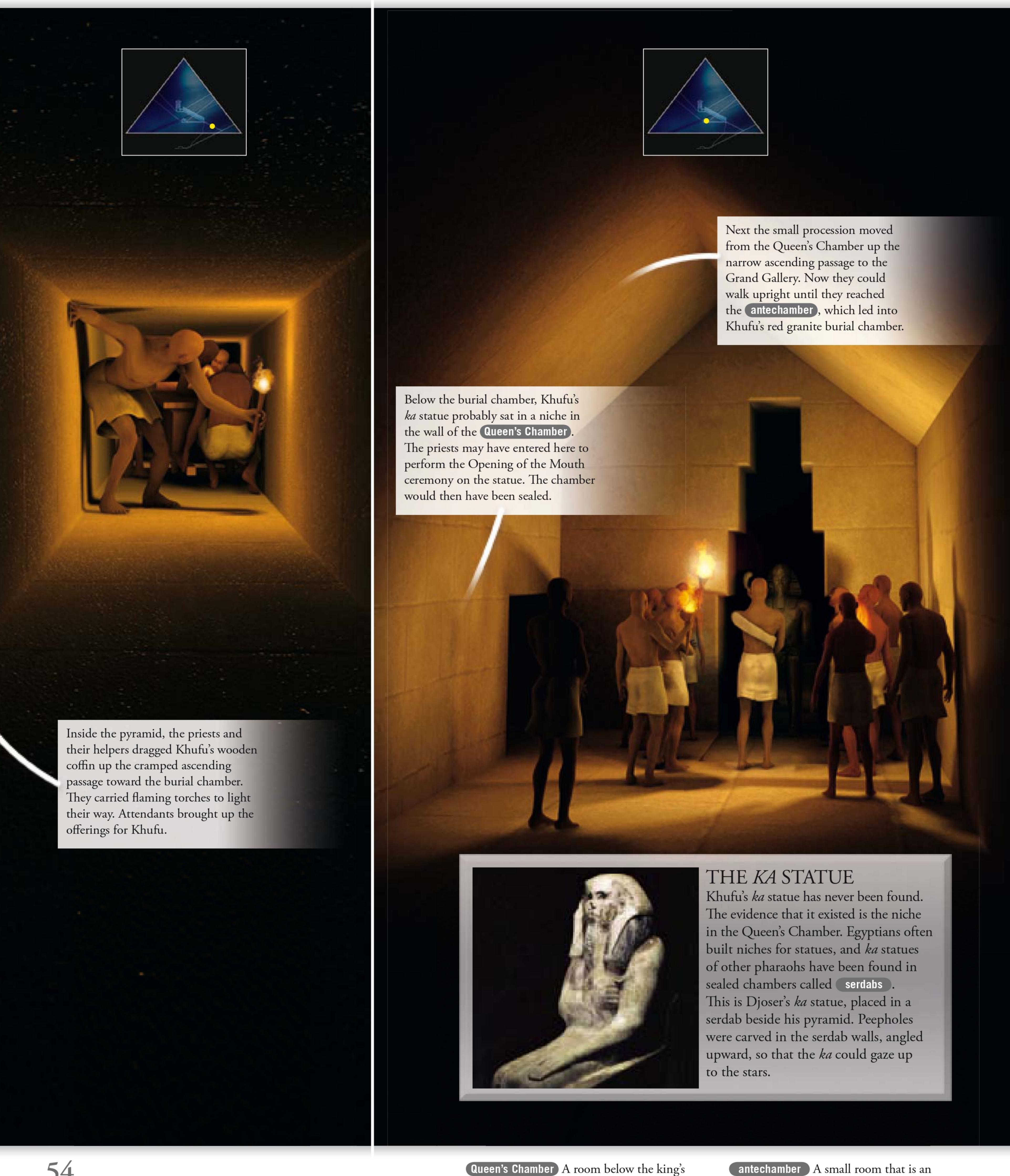






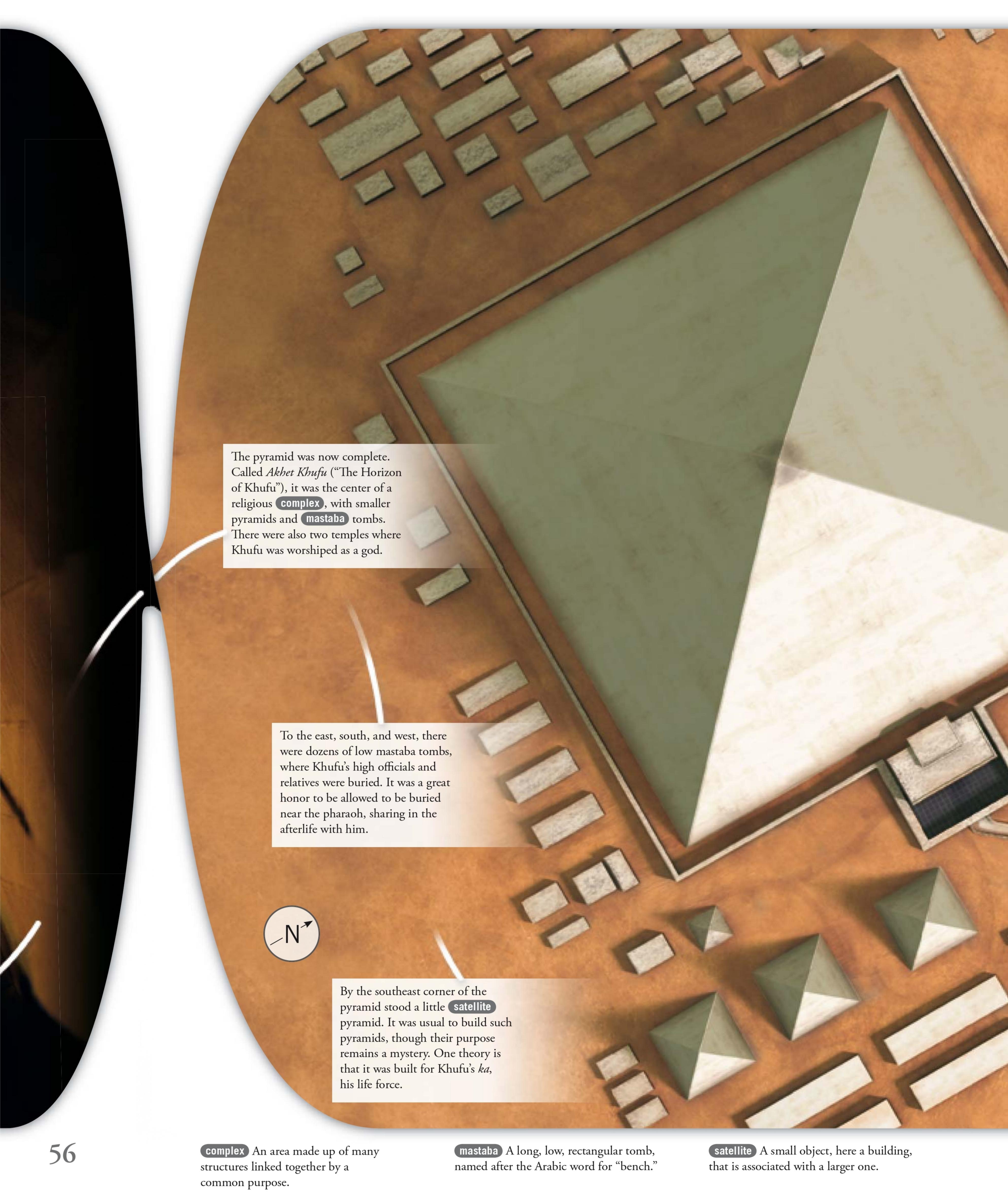




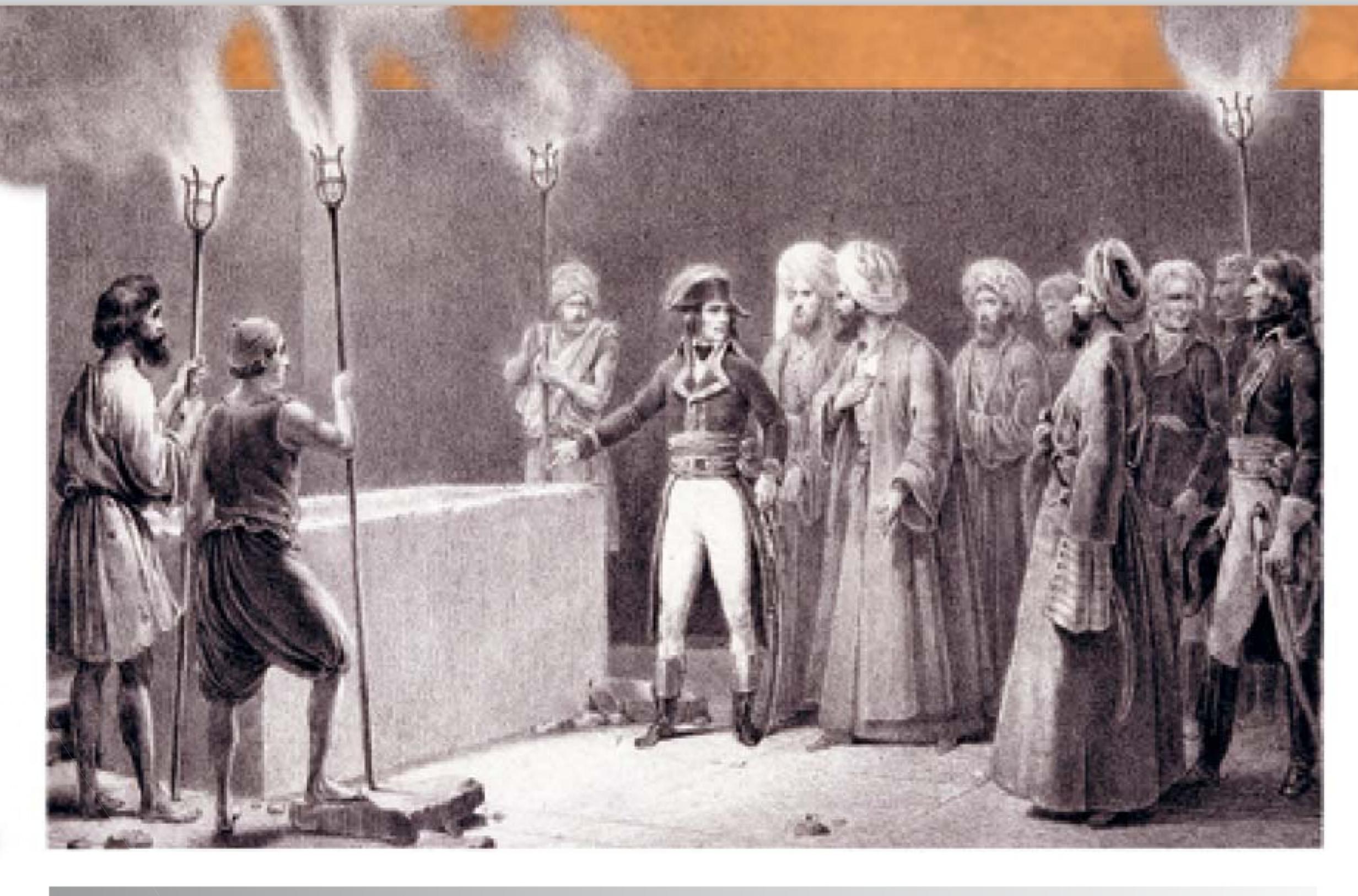




serdabs The name comes from an Arabic word meaning cellar. The Egyptian name was per-twt (statue house).







In this engraving, Napoleon Bonaparte examines the granite sarcophagus in the King's Chamber, questioning his Egyptian guides.

"One of the men narrowly escaped being crushed to pieces. A large block of stone... fell from the top while the man was digging."

Giovanni Belzoni, in Narrative of Operations and Recent Discoveries in Egypt and Nubia, 1822, on the dangers of digging into Khafra's pyramid

#### EXPLORING THE PAST

## REDISCOVERY

THE PYRAMIDS' SECRETS ARE REVEALED

"Forty centuries

look down on

you from these

addressing his troops in Egypt

French general Napoleon Bonaparte

pyramids."

in 1798

espite all of Khufu's security measures, his pyramid was still robbed in ancient times, like every other Egyptian pyramid. The thieves may even have been workers who had helped to build the pyramid. They knew exactly

where to tunnel in to find their way around the granite blocks sealing the ascending passage.

#### Exposed!

After the pyramid was broken into, it lay open to visitors and swarms of bats, which nested there for thousands of years.

The finely polished outer casing stones were also stripped away.

They were reused as construction materials, probably to build the new town of Cairo, founded in AD 969.

#### Crawling inside

In 1765, an Englishman named Nathaniel Davison made the first new discoveries at the Great Pyramid. He found an opening high up on the wall of the

Grand Gallery. After crawling through layers of foul-smelling bat dung, with a handkerchief over his mouth to stop him from being sick, he came across the first relieving chamber, above the burial chamber. This is still known as Davison's chamber.

Davison also explored the upper part of the escape shaft, which he called a well. He found it blocked with rubble 200 ft (60 m) down.

#### More discoveries

In 1798–1801, a French army commanded by Napoleon Bonaparte occupied Egypt.
Napoleon had 175 scientists and surveyors with him, and

they carried out a survey of Egypt's monuments, including Khufu's pyramid. Later, Italian Giovanni Caviglia discovered the unfinished underground chamber in 1817, and cleared the blocked lower half of the escape shaft, showing that it connected to the descending passage. He also discovered the two mysterious shafts in the King's Chamber.

#### Entering the pyramids

In 1818, an Italian ex-circus strongman, Giovanni Belzoni, found the upper entrance to Khafra's pyramid. It had been sealed for centuries. Belzoni discovered that it had been robbed, too, and the sarcophagus lid was broken in two pieces. In 1837, Richard Vyse, an English army officer, used gunpowder in Khufu's pyramid to blast a passage above Davison's chamber and found four more chambers. Vyse also used gunpowder on the second and third pyramids. He even drilled a deep, 27-ft (8-m) hole in the back of the Sphinx to find out if it had any inner chambers.

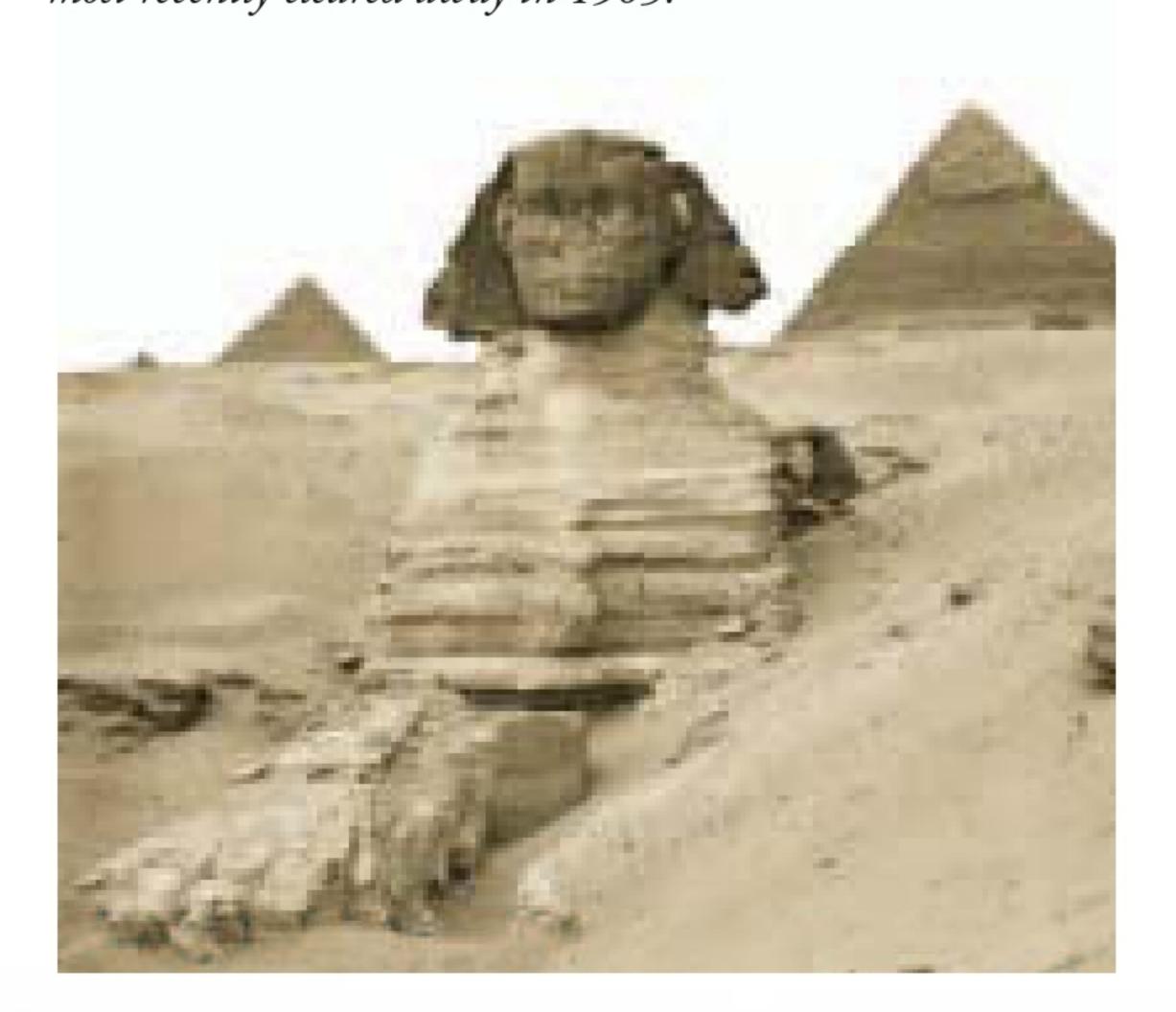
Archaeological digs at Giza could involve dozens of people. This photograph from the 1920s shows the team led by US archaeologist George Reisner.



#### Scientific study

The first scientific archaeologist to work at Giza was William Flinders Petrie, nicknamed the "father of Egyptian archaeology." In the 1880s, he carried out a detailed survey of the entire Giza plateau, including the Great Pyramid, whose passages and chambers he carefully measured. Petrie was devoted to this task, and even chose to sleep inside a rock tomb so that he could be near the excavation site. Due to the extreme heat, he often wore nothing but his underwear—he noticed that if it was pink he could scare off curious tourists and thus work undisturbed.

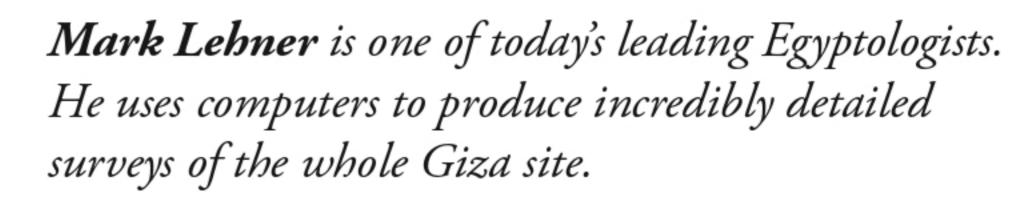
Shifting sands have buried the Sphinx many times in its long history, as can be seen in this old photograph. They were most recently cleared away in 1905.





#### Rapid progress

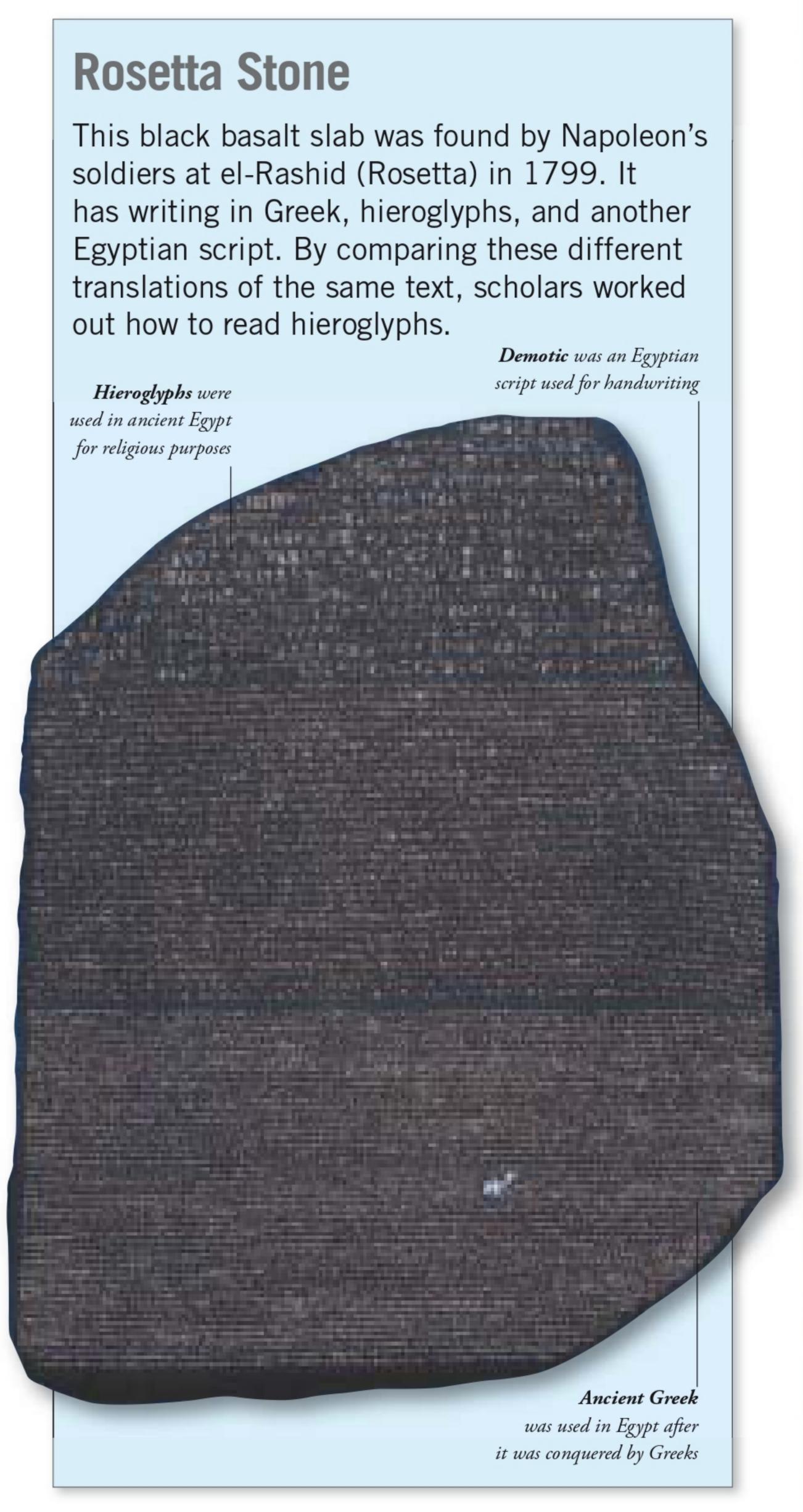
During the 20th century, Petrie was followed by many more archaeologists. They included American George Reisner, who discovered the tomb of Khufu's mother, Queen Hetepheres, in 1925. An unrobbed tomb was rare and exciting indeed. This one contained a sealed sarcophagus, which Reisner opened in front of a specially invited audience in March 1927. But to his dismay, it was completely empty. By the 1950s, Egyptian archaeologists were also working at Giza. It was an Egyptian, Kamal el-Mallakh, who discovered Khufu's two intact boat pits in 1954. Since 1990, Egyptian Zahi Hawass and American Mark Lehner have both been working on the Giza plateau. They



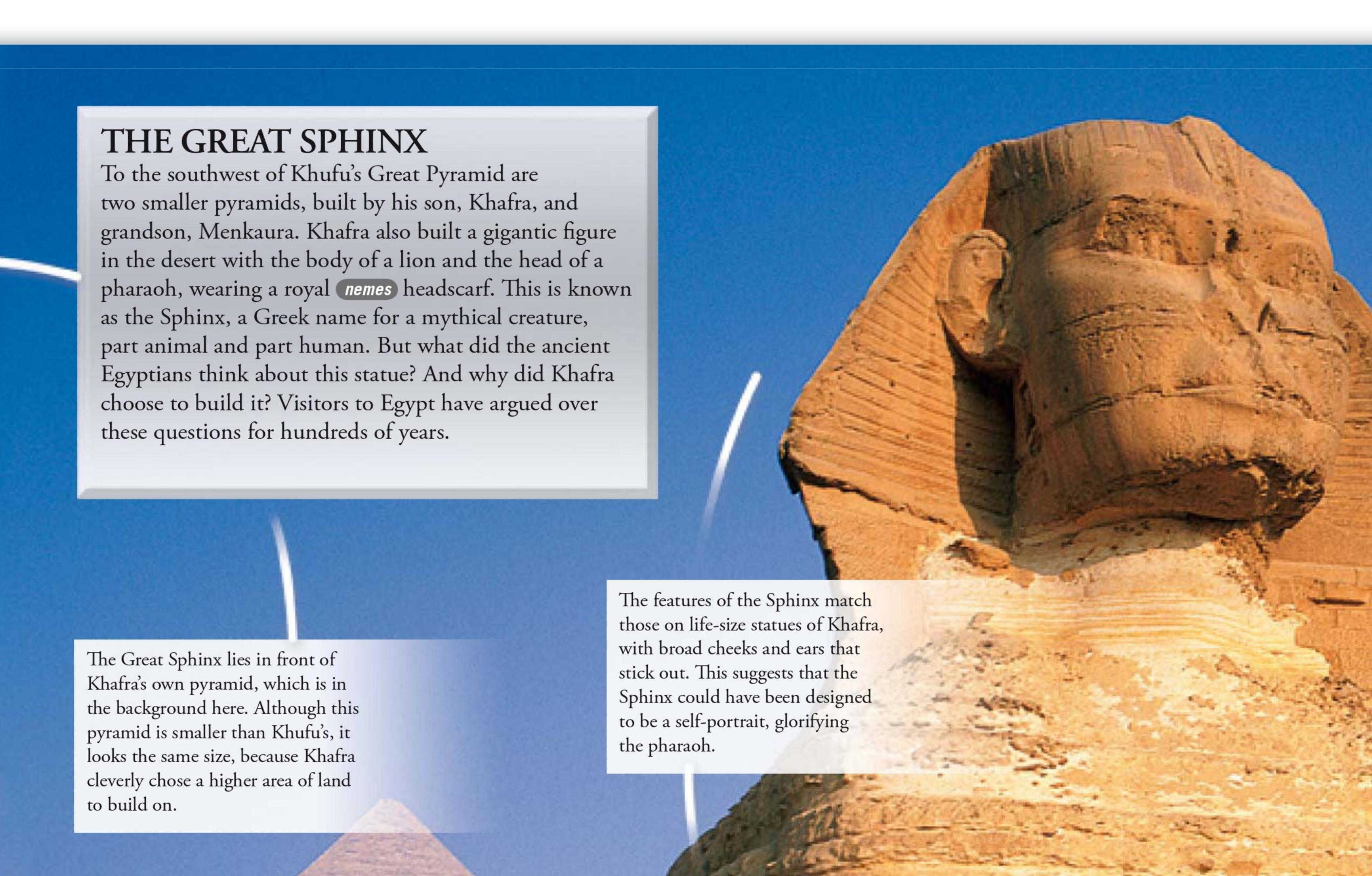
uncovered the pyramid workers' food-processing area and the cemetery where the workers who built the pyramid were buried.

#### Weird ideas

Despite everything we have learned, some people refuse to accept the pyramids were built by pharaohs as tombs. Books and websites claim that they were built by aliens or an ancient lost civilization. Zahi Hawass says at his lectures that anyone can make a lot of money from the pyramids—just make up an idea, the crazier the better, and write a book about it! Even today, the pyramids continue to fascinate us.







linking Khafra's pyramid and his valley temple. This is good evidence that it was built for Khafra, not another pharaoh. His workers began by cutting a U-shaped trench to remove sand and rock and expose a mound of bedrock. This was then carved to make the Sphinx.

The Sphinx lies beside the causeway

The Great Sphinx was carved out of limestone bedrock. It is just over 236 ft (72 m) long and 65 ft (20 m) high. This was the largest sculpture that Egypt had ever seen, and its size would not be equazled for over a thousand years.



The name Khafra means "appearing

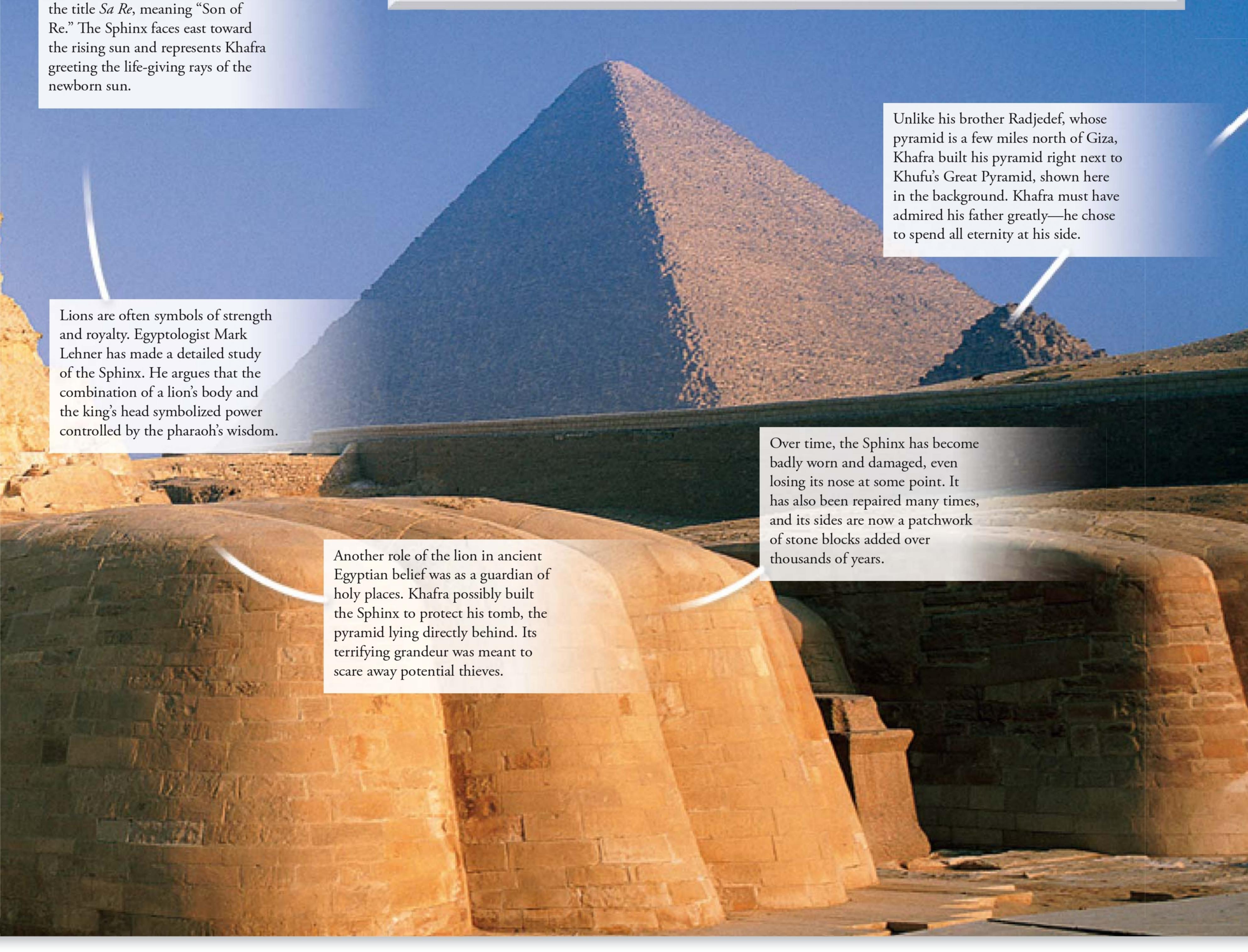
reign as pharaoh, Khafra also adopted

like Re," the sun god. During his

### THE LEGEND OF TUTHMOSIS

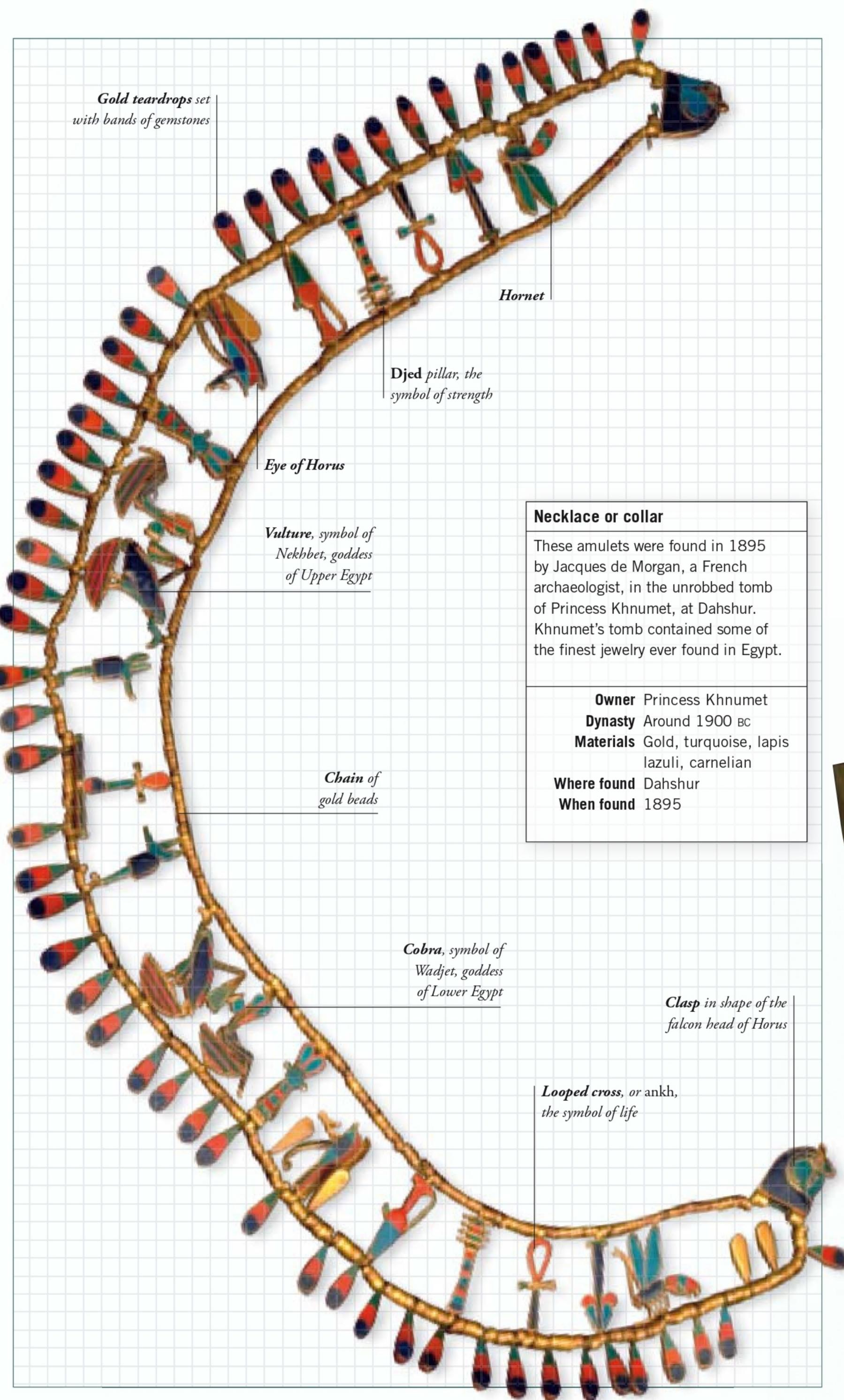
Between the paws of the Sphinx, there is a granite stele, placed there by Pharaoh Tuthmosis IV around 1400 BC. In its inscription, Tuthmosis tells how, as a young prince, he had gone hunting at Giza and fallen asleep in the shadow of the Sphinx. At that time, the Sphinx was partly buried in sand. The Sphinx appeared to him in a dream and promised him the throne of Egypt if he cleared away the sand. Tuthmosis did as he was asked and became king. Pictures on the stele show the grateful pharaoh worshiping the Sphinx.

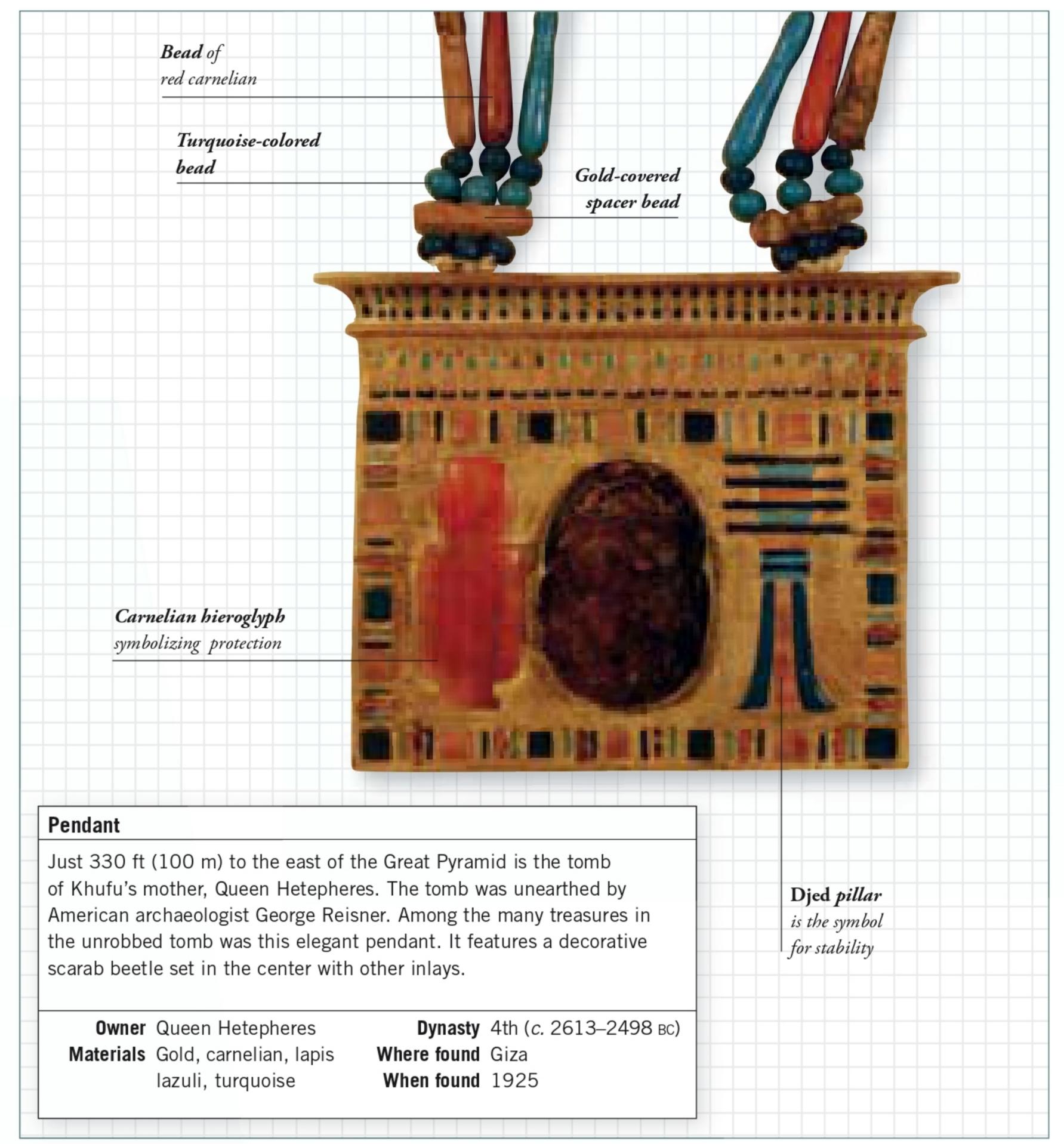
STELE OF TUTHMOSIS IV

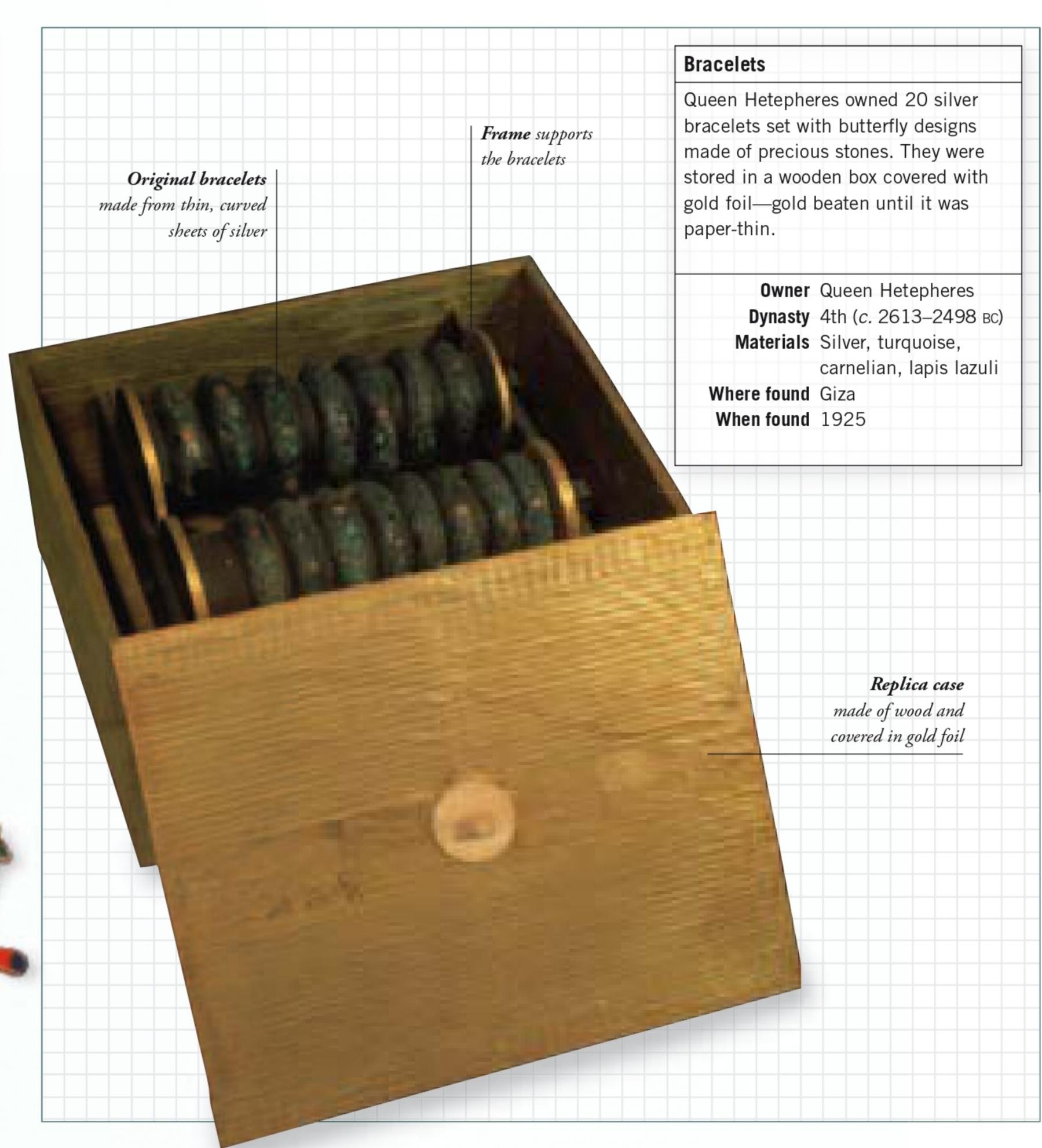


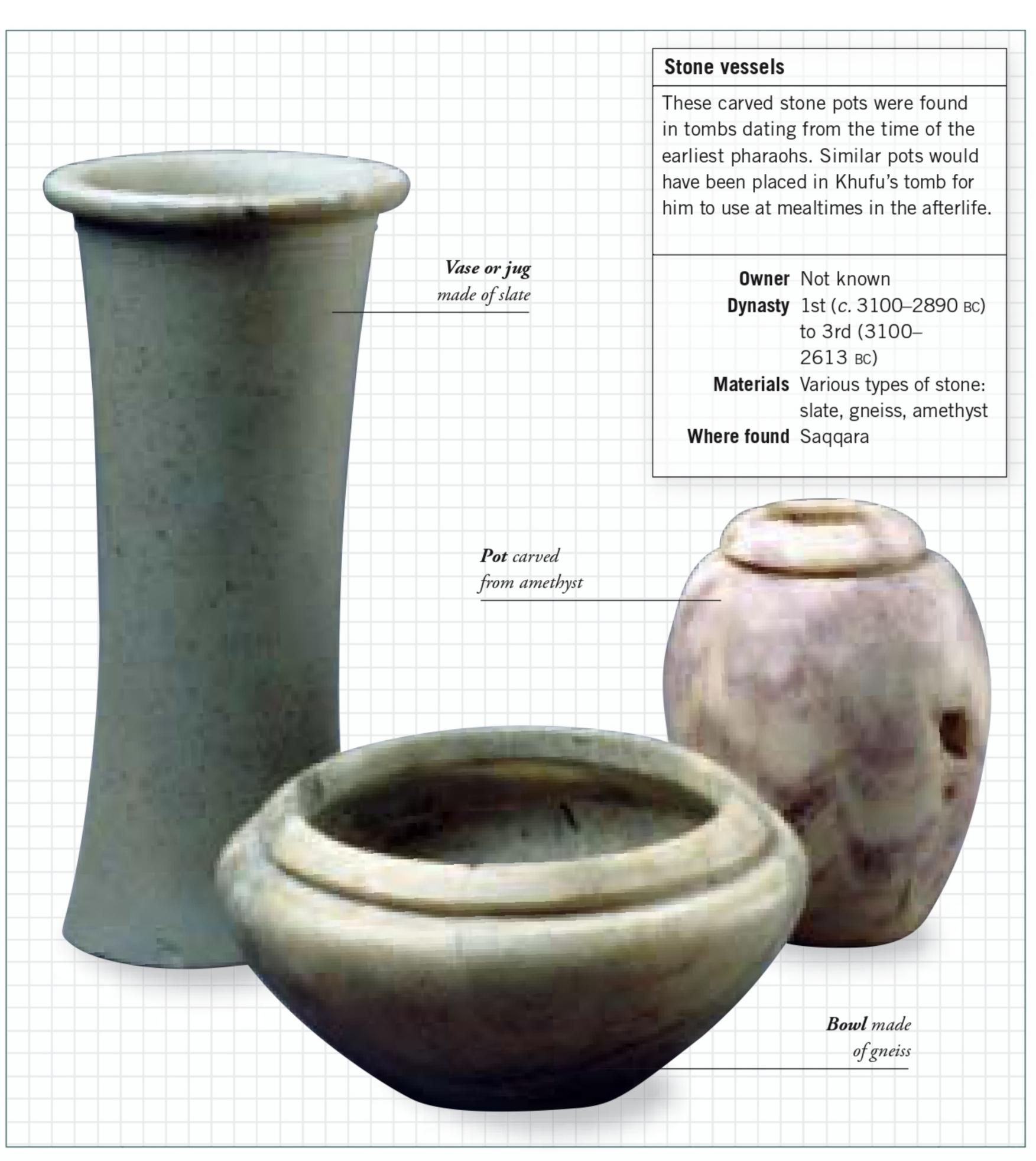
#### CATALOG OF TREASURES

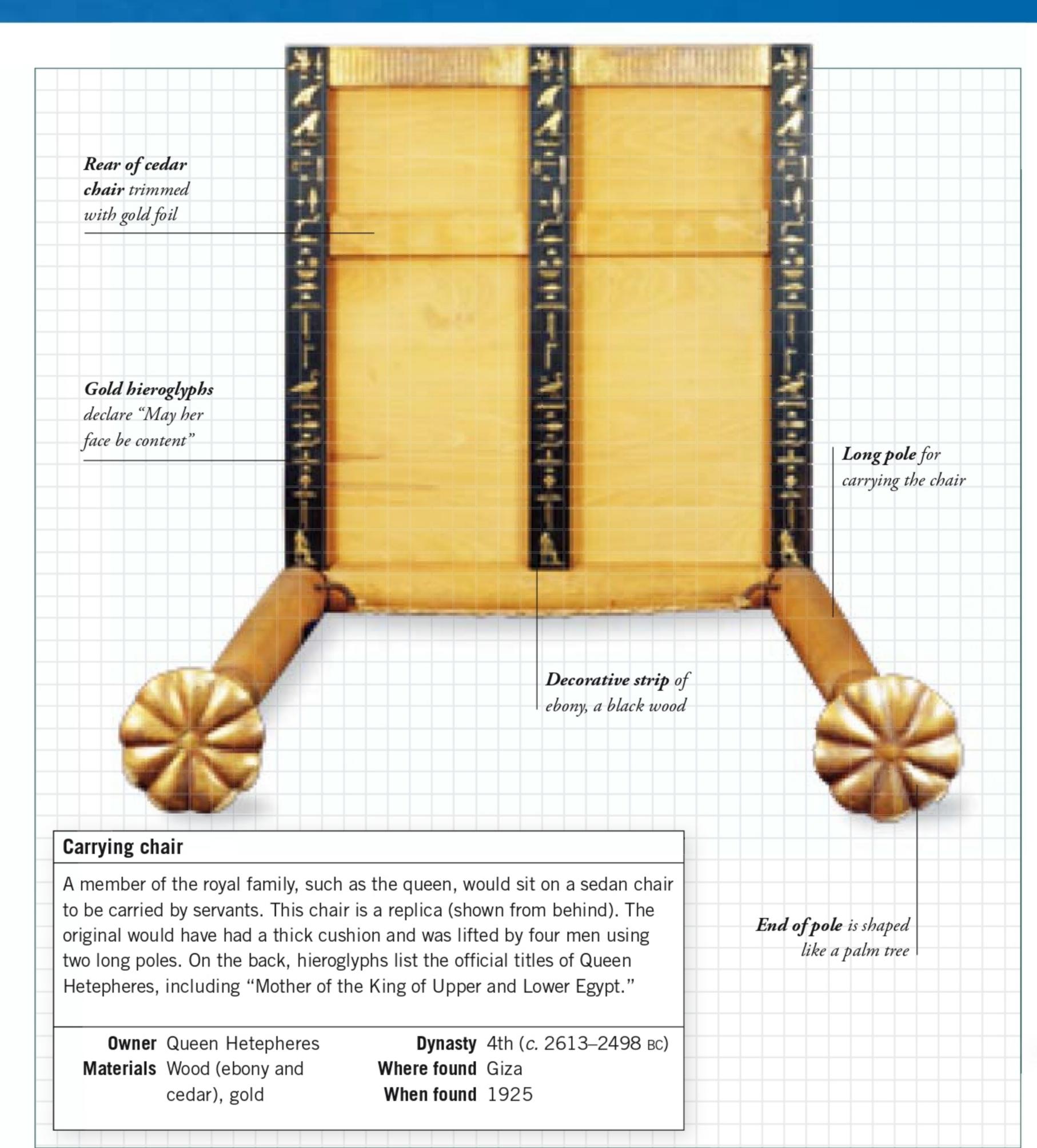
Every single pyramid was looted in ancient times, so we do not know for sure what riches they contained. Luckily, archaeologists have found a few unrobbed tombs near pyramids. Some of the most spectacular finds came from the secret tomb of Khufu's mother, Queen Hetepheres. Buried in an underground chamber next to the Great Pyramid, this had not only exquisite jewelry and fine pottery, but also the oldest known furniture in the world.

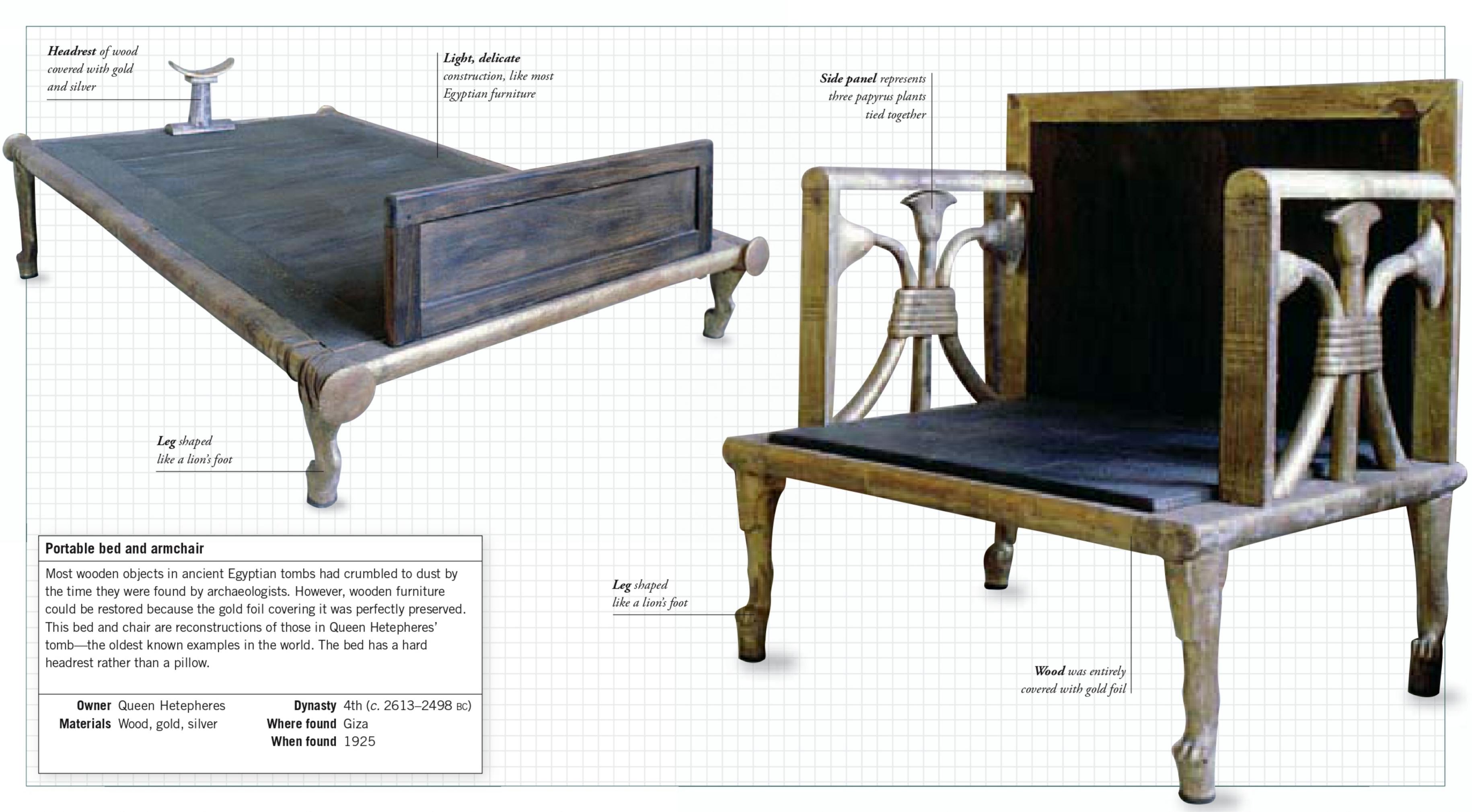






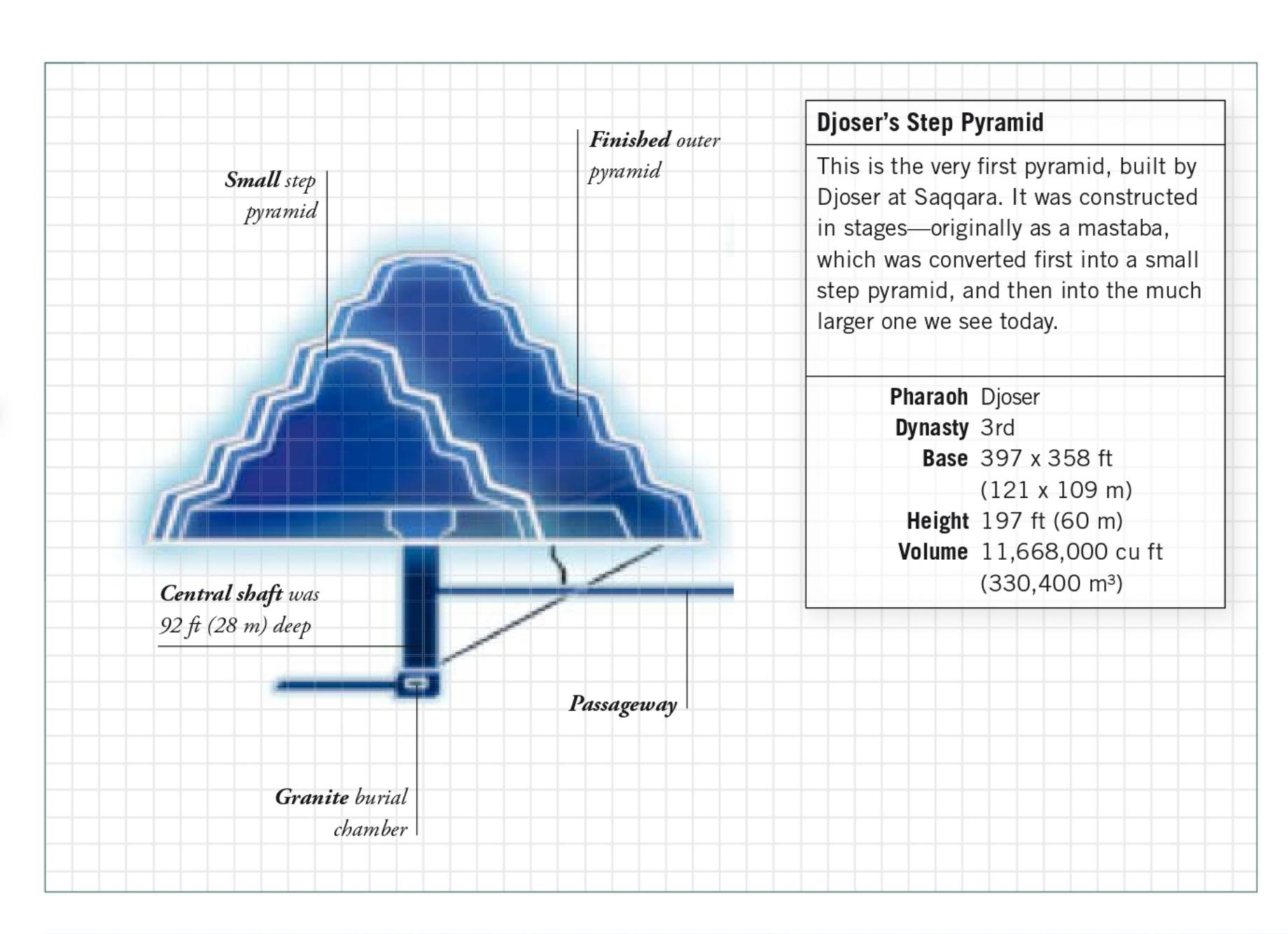


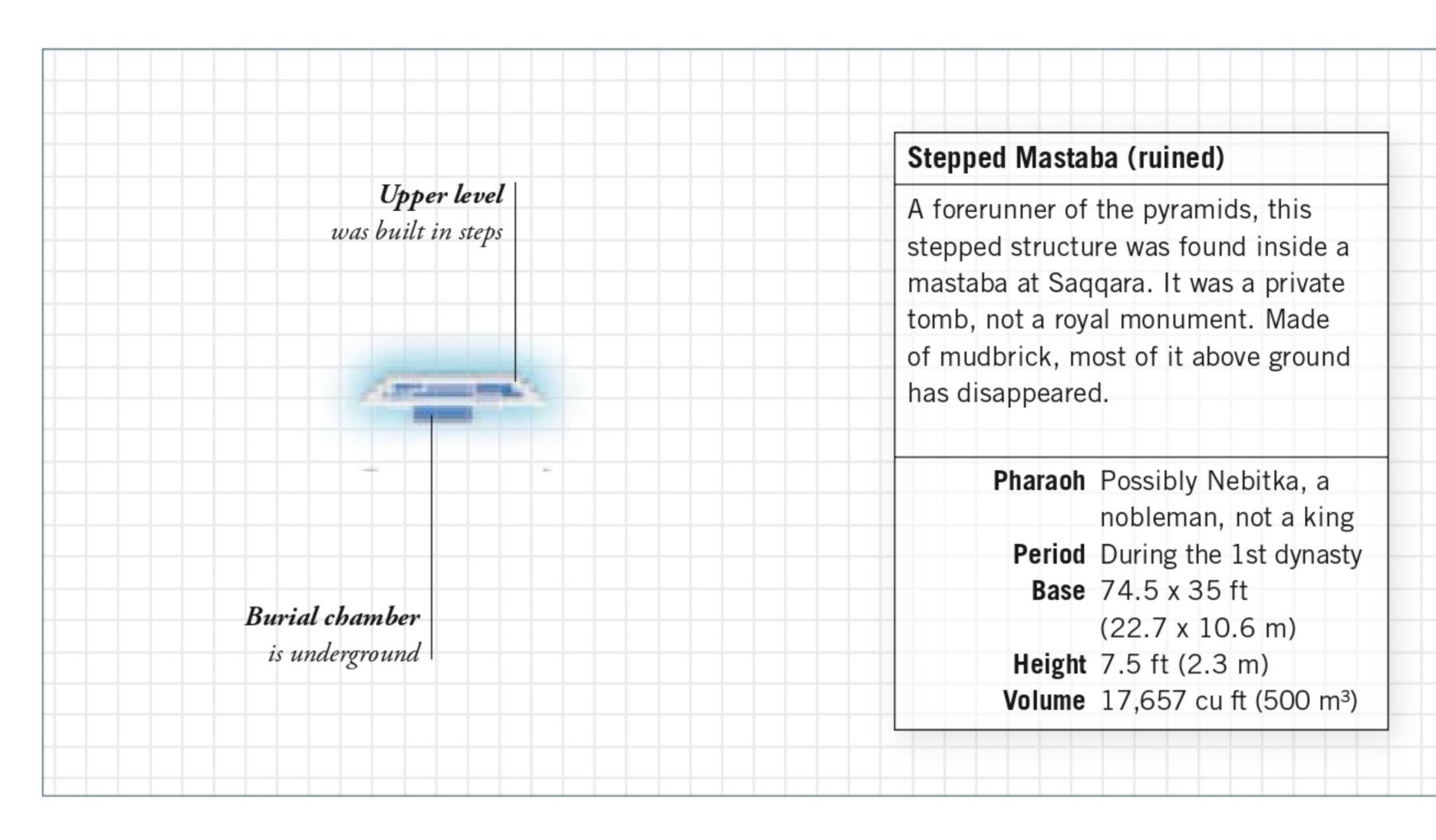




#### CATALOG OF PYRAMIDS

Kings built pyramids of varying shapes and sizes in ancient Egypt over a period of about 900 years. To understand why Khufu's tomb is called the Great Pyramid, try comparing its plan with those of earlier and later pyramids. Khufu's was not just bigger than all of the others—everything about it was on a more magnificent scale. His pyramid has not only the highest burial chamber, but also the deepest underground chamber—98 ft (30 m) below the ground.





#### The pyramid-builders

In around 300 BC, an Egyptian priest called Manetho listed all the known pharaohs, placing them in 31 dynasties. Each dynasty was a series of rulers from the same family. Experts still debate the numbers and dates of the dynasties. Here is a list of rulers at the time of the pyramids.

1st Dynasty 3000–2890 BC Seven pharaohs, ruling after the unification of Egypt
2nd Dynasty 2890–2686 BC Between seven and ten pharaohs
3rd Dynasty 2686–2613 BC Five or six pharaohs, including Djoser
4th Dynasty 2613–2498 BC Six pharaohs, including Snefru, Khufu, Radjedef, and Khafra

5th Dynasty 2494–2345 BC Eight or nine pharaohs, including Userkaf and Nyuserra

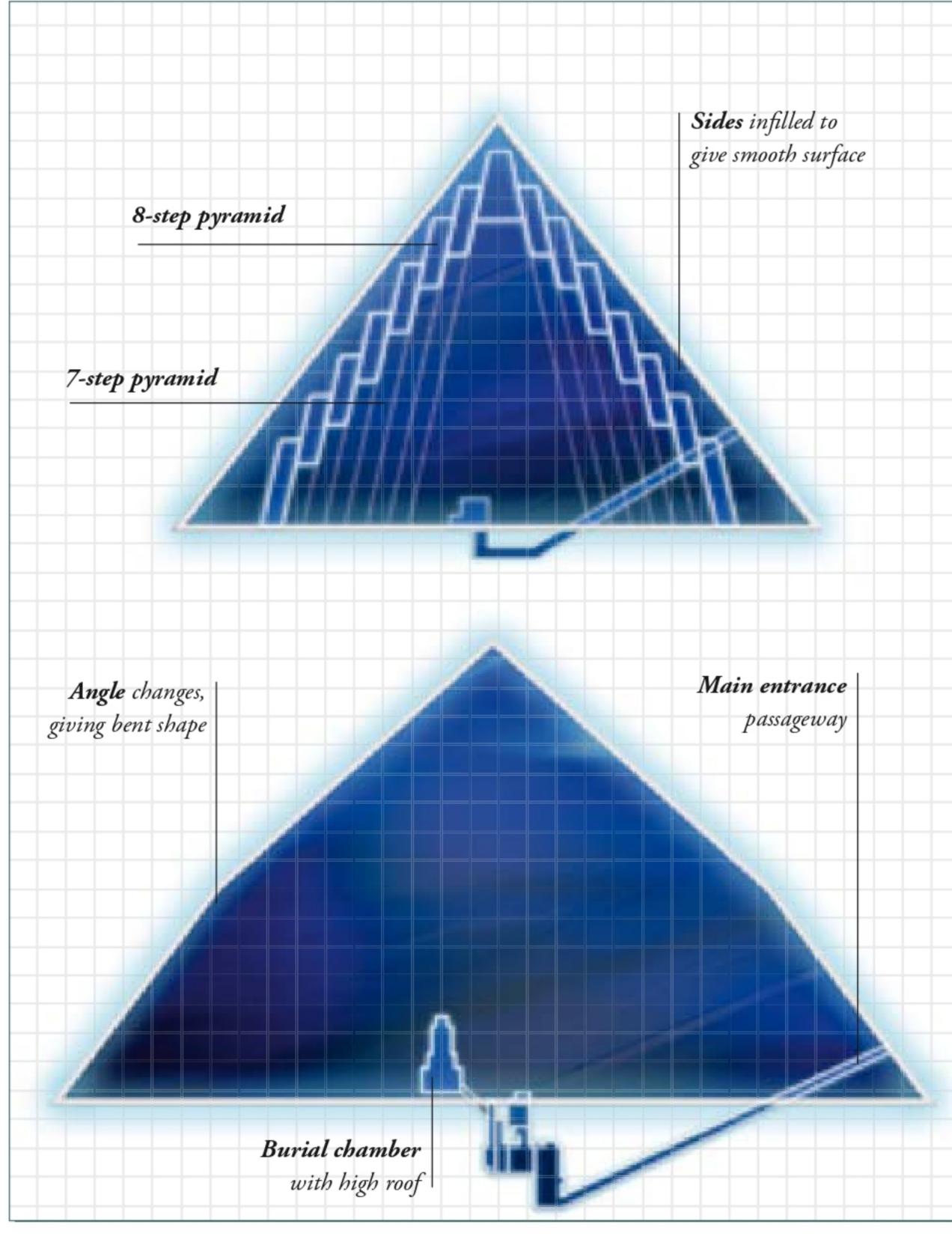
6th Dynasty 2345–2181 BC Between four and six pharaohs, including Teti
7th/8th Dynasties 2181–2125 BC Unknown number of pharaohs, including Ibi

9th/10th Dynasties 2160-2055 BC Unknown number of pharaohs, who might have built some pyramids

11th Dynasty 2125-1985 BC Seven pharaohs, who did not build any pyramids

12th Dynasty 1985–1795 BC Eight pharaohs, including Senusret I

13th Dynasty 1795–1725 BC Unknown number of pharaohs, including Khendjer



#### Snefru's First Pyramid

At Meidum, Snefru began by building a pyramid with seven steps, which was then enlarged to eight. Much later, the steps were filled in to make a smooth-sided pyramid, which now lies in ruins.

Pharaoh Snefru

Dynasty 4th

Base 472 x 472 ft
(144 x 144 m)

Height 302 ft (92 m)

Volume 22,557,000 cu ft
(638,733 m³)

#### Snefru's Bent Pyramid

With his second attempt, this time at Dahshur, Snefru's architects made the angle of the pyramid's sides too steep. This meant too much weight was placed on the foundations, and so the angle was reduced halfway up.

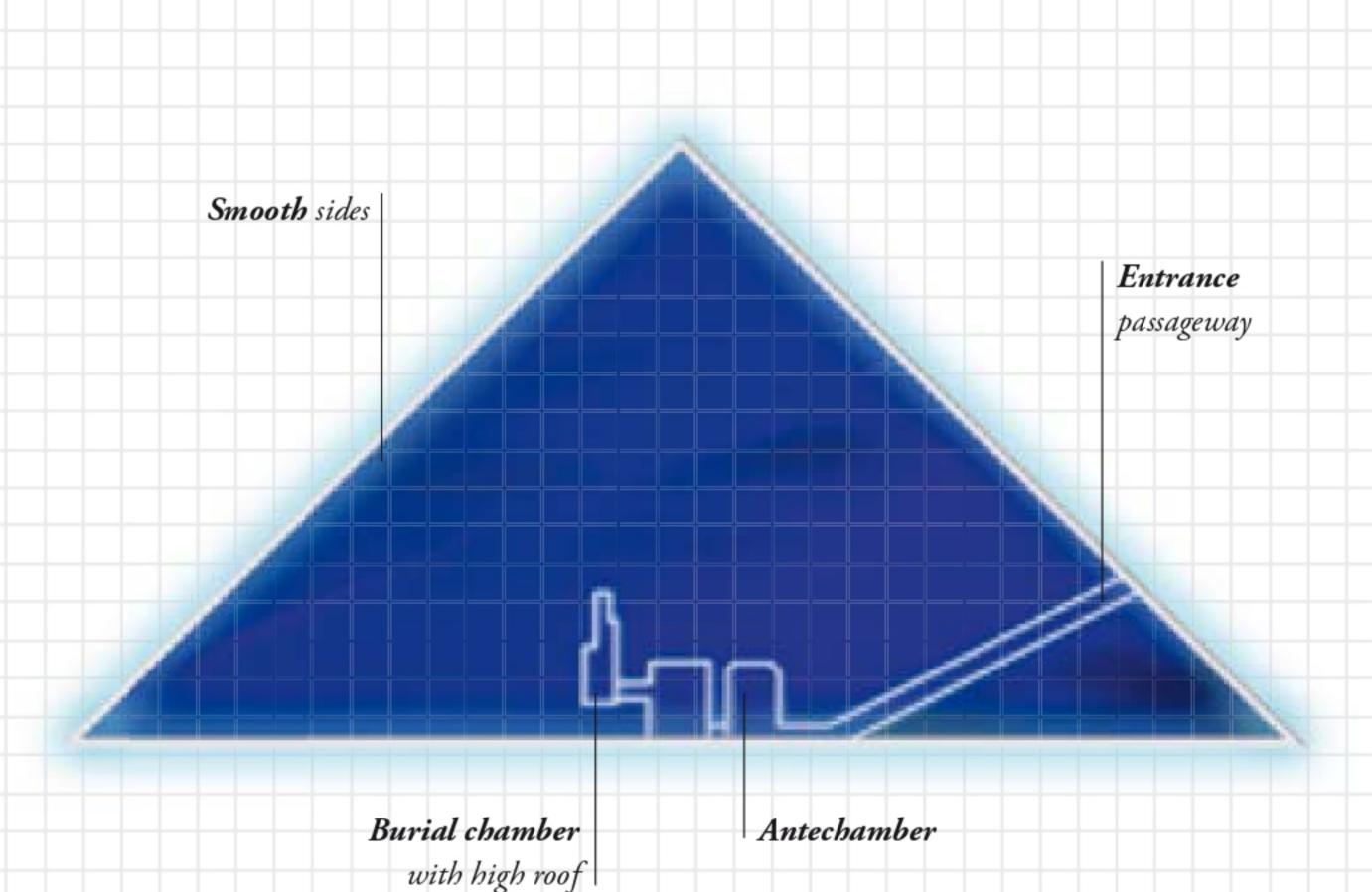
Pharaoh Snefru

Dynasty 4th

Base 617 x 617 ft
(188 x 188 m)

Height 345 ft (105 m)

Volume 43,686,000 cu ft
(1,237,040 m³)



#### Snefru's North Pyramid

Also known as the Red Pyramid, this was the third pyramid built by Snefru. Located at Dahshur, its sides sloped more gently than the Bent Pyramid nearby. Snefru probably could have built a steeper-sided structure, but he did not want to take any chances after the problems caused by the Bent Pyramid. Like both of his previous pyramids, the burial chamber here had a high, stepped roof.

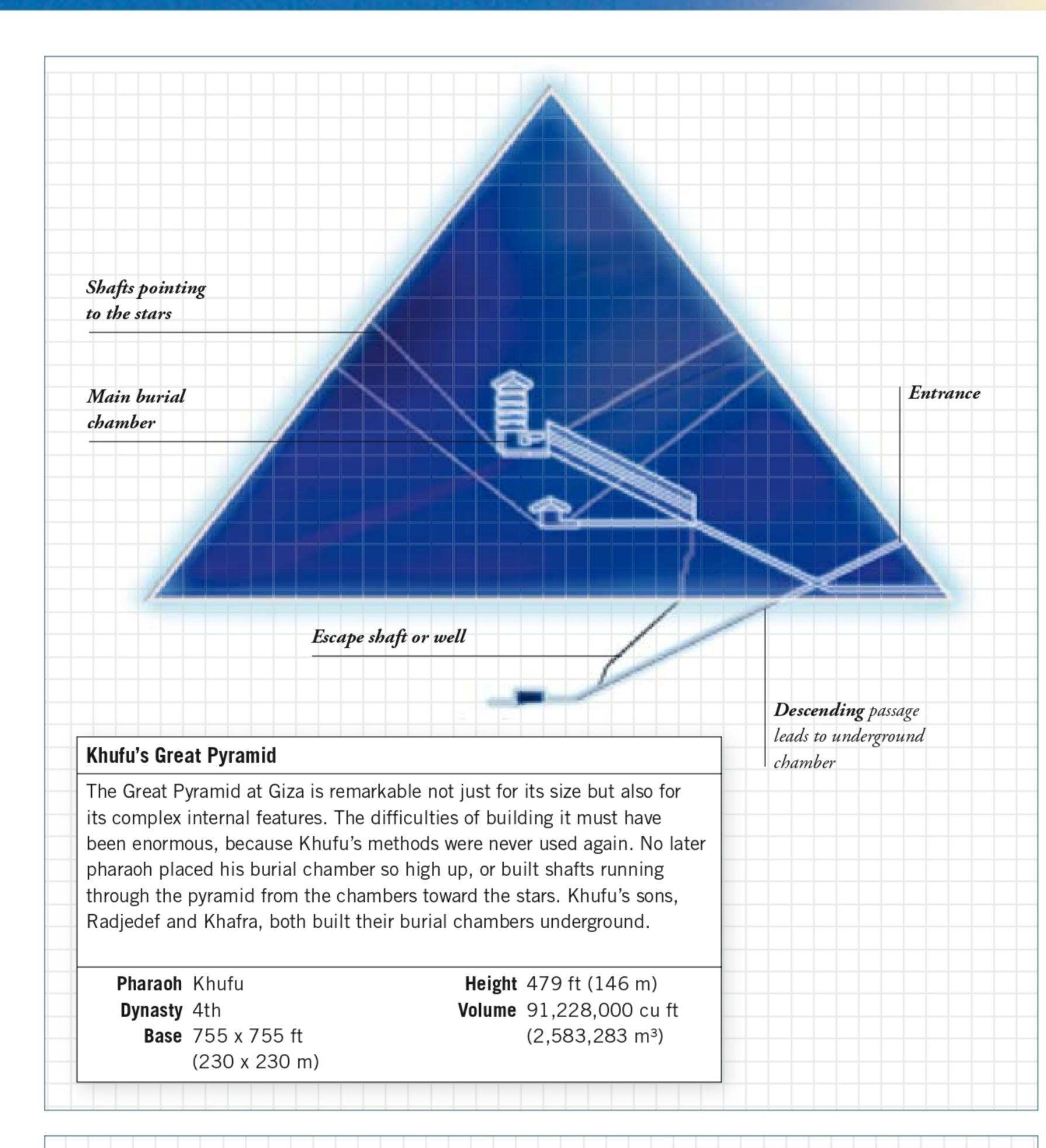
Pharaoh Sneferu

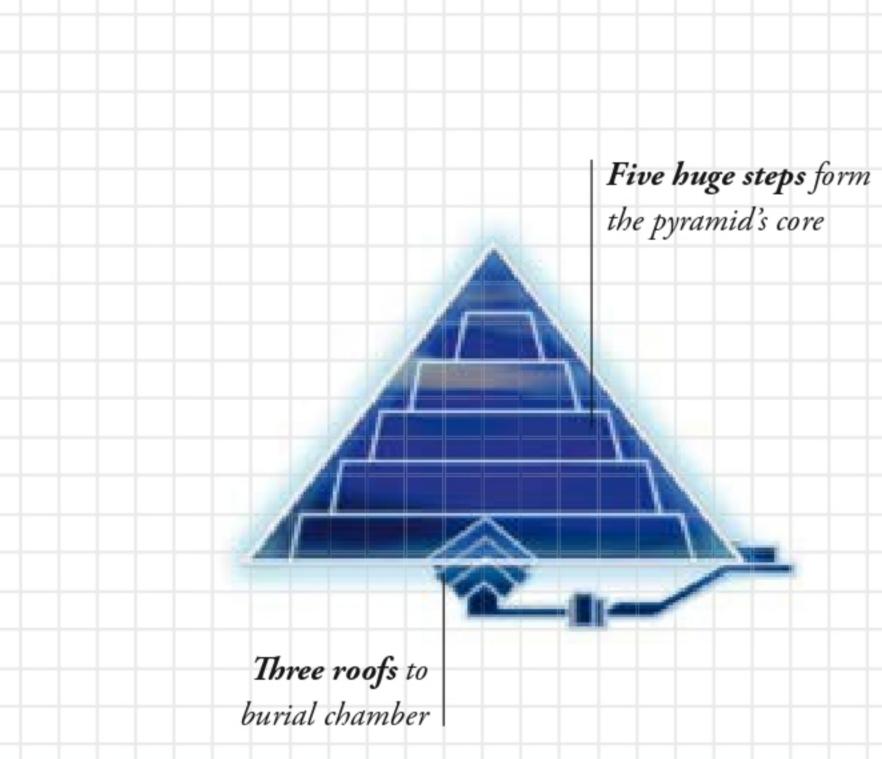
Dynasty 4th

Base 722 x 722 ft

(220 x 220 m)

Height 345 ft (105 m)
Volume 59,823,000 cu ft (1,694,000 m³)





#### Teti's Pyramid

Teti and pharaohs of the sixth dynasty continued the fifth-dynasty custom of building pyramids with stepped cores, and burial chambers with angled beams in the roofs. Teti's burial chamber has three roofs on top of each other.

Pharaoh Teti
Dynasty 6th
Base 258 x 258 ft
(78.75 x 78.75 m)
Height 172 ft (52.5 m)
Volume 3,808,000 cu ft
(107,835 m³)

#### Pyramids of the world

Pyramids were the world's first massive stone buildings. Since the pharaohs, many peoples around the world have built pyramids. The best known, in Mexico and Central America, were mostly temples rather than tombs. Modern pyramids use a variety of spectacular materials.

**Mesoamerican pyramids** The largest pyramid in America is Teotihuacan, the Pyramid of the Sun, an ancient temple built in central Mexico between AD 150 and 650. Its base is about the same size as Egypt's Great Pyramid, but it is only half the height. We still do not know who built it, or why.

**Mayan pyramids** The Maya of Central America existed from about AD 300 to 900. They built pyramids as temples that were often royal tombs as well. This was because they worshiped dead kings as gods. On top of the pyramid was a small temple where the dead king lying beneath was worshiped.

**Aztec pyramids** The Aztec civilization of Mexico reached its height in about 1400–1520. It built impressive pyramids as temples to Huitzilopochtli, the war god, and Tlaloc, the rain god. On top of the pyramids, prisoners captured in war were sacrificed as offerings to them.

**Louvre pyramid** Perhaps the most famous modern pyramid is in the courtyard of the Louvre, an art museum in Paris. Made of glass and steel, it is 71 ft (21.6 m) high. It serves as the entrance to the museum's underground galleries, and allows light to flood in. The architect was I. M. Pei.

#### Userkaf's Pyramid

Pharaoh Userkaf, the founder of the fifth dynasty, roofed his burial chamber in a new way. He used huge limestone beams, placed at a sharp angle against each other. This method protected the burial chamber from the weight above.

Pharaoh Userkaf

Dynasty 5th

Base 240 x 240 ft
(73.3 x 73.3 m)

Height 161 ft (49 m) Volume 3,104,000 cu ft (87,906 m³)

Angled beams support massive weight above burial chamber

# Smooth outer surface

Stepped core

Nyuserra's Pyramid

Userkaf was followed by four pharaohs, including Nyuserra, who built their pyramids at Abusir. They constructed them using stepped cores, which were then filled in to make smooth-sided pyramids.

Pharaoh Niuserre
Dynasty 5th
Base 259 x 259 ft
(78.9 m x 78.9)
Height 170 ft (51.7 m)
Volume 3,978,000 cu ft
(112,632 m³)

# Original shape, before falling into a ruin

#### Ibi's Pyramid (ruined)

The only surviving pyramid of the eighth dynasty, this one at Saqqara was later almost completely destroyed by stone thieves. The surviving ruins are just 10 ft (3 m) high, but it may have been seven times higher when completed.

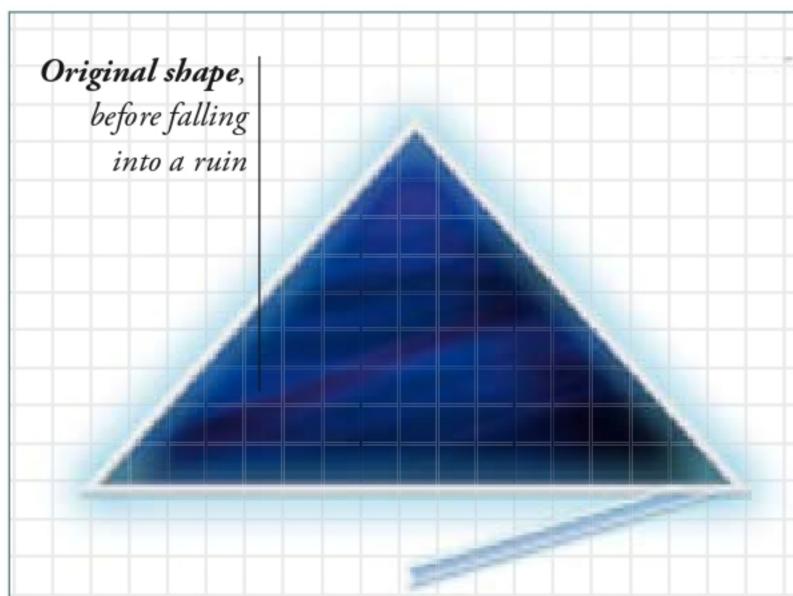
Pharaoh Ibi

Dynasty 8th

Base 103 x 103 ft
(31.5 m x 31.5 m)

Height Possibly 69 ft (21 m)

Volume Possibly 247,000 cu ft
(6,994 m³)



#### Senusret I's Pyramid (ruined)

Pyramid-building revived under this pharaoh. At Lisht he built on a scale unmatched since the fifth dynasty. His burial chamber is so deep that it has never been found. Attempts to reach it are blocked by water underground.

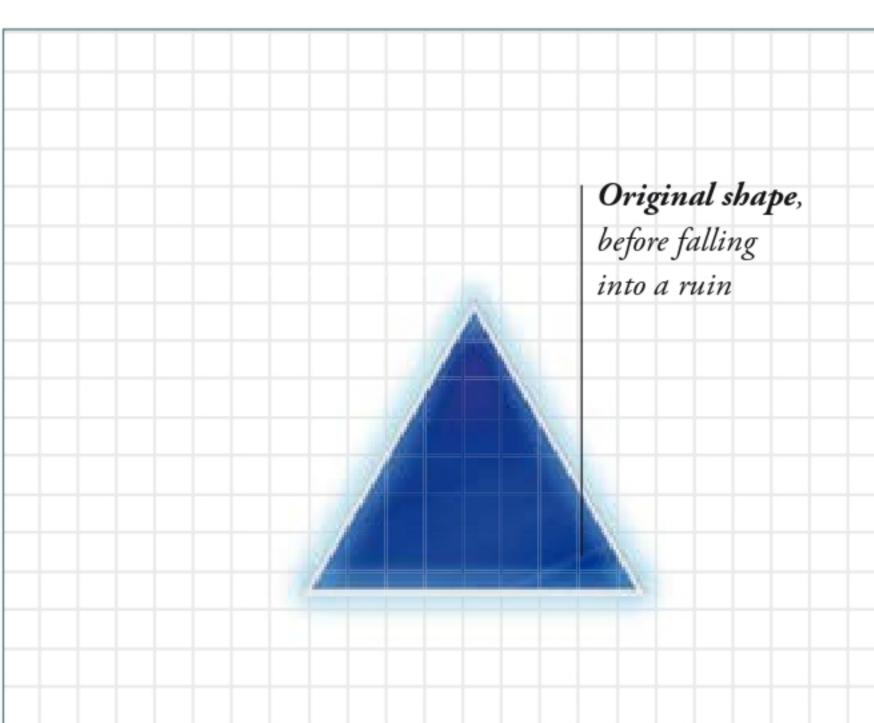
Pharaoh Senusret I

Dynasty 12th

Base 344 x 344 ft
(105 x 105 m)

Height 201 ft (61.25 m)

Volume 7,949,000 cu ft
(225,093 m³)



#### Khendjer's Pyramid (ruined)

Khendjer was one of the last pharaohs to build a pyramid. Sited at Saqqara, it had a mudbrick core with limestone casing. Mudbrick was an easier material to use, but the finished appearance was the same as a stone monument.

Pharaoh Khendjer

Dynasty 13th

Base 172 x 172 ft

(52.5 x 52.5 m)

Height 121 ft (37 m)

Volume 1,557,000 cu ft

(44,096 m³)

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